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A

DESCRIPTION

OF THE

ARTERIES OF THE HUMAN BODY,

REDUCED INTO THE

FORM OF TABLES,

BY

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TRANSLATED FROM THE LATIN,

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ADVERTISEMENT.

THE convenience arising from TABLES, in all cases where they are practicable, is well known: They are, however, peculiarly suited to Anatomical description; in which arrangement, brevity, and minuteness, are each required.—In conducting the Anatomical labours of others, I have had so frequent occasion to regret the want of descriptions of this sort, that I had long since collected materials for a series of Tables, containing an account of the demonstrative parts of Anatomy. When the present Work fell into my hands, the high reputation of the Author, the excellence of the plan, and the accuracy of its execution, rendered any similar performance upon the *Arteries* unnecessary. I accordingly prevailed upon a Gentleman (every way qualified for the task,) to render it into English; which has been done with so much care and faithfulness, that I have not had occasion to make a single correction of consequence.

Whilst this Translation was in the press, information was received that another of the same Work had appeared in Edinburgh. Upon perusing that publication, however, there seemed no reason for abandoning the present undertaking.

In the following Tables, the names of many of the Muscles have been altered to others more commonly employed in this country:—Those of the Arteries have been given in Latin, in conformity to the custom of the beſt Authors upon the Blood-vessels:—Professor MURRAY's Preface has been omitted, as it did not appear essential;—and from the nature and size of the Work, it has not been thought necessary to prefix Contents.

JAMES MACARTNEY.

LONDON, 18th April, 1801.

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A

DESCRIPTION OF THE ARTERIES,

REDUCED INTO THE FORM OF TABLES.

SECTION I.

The Branches which proceed from the Arch of the Aorta.

THE mouth of the great artery, which is named the AORTA, is situated at the upper and back part of the posterior ventricle of the heart. It seems to arise out of the very substance of the heart; since it is not only connected to the internal surface by a very firm adhesion, but also to the external part by some of the fleshy fibres being confounded with the white line named *tendo arteriosus*, which seems to terminate the muscular substance of the heart. The transverse fibres are also inserted externally into the aorta, and cover it for the space of a line and a half. Immediately after leaving the heart, it becomes enlarged, and does not recover its ori-

ginal diameter till the giving off of the right subclavian artery. It ascends behind the *pulmonary artery*, inclining a little to the right; then it gradually bends towards the left, in such a manner that, having formed its transverse arch, it is seen behind the lungs, on the left side of the bodies of the vertebræ. Supported by these, it descends in a pretty straight course; but, in its passage through the abdomen, it begins to incline to the right, till at last it gets on the middle of the bodies of the vertebræ. By the arch of the aorta is understood that part of the artery which is inflected almost in an elliptical manner; its right side passing first to the right, then to the left; and its left side being nearly straight. The old division of the artery into the *ascending transverse*, and *descending*, is now laid aside. In considering the extent of the arch, it may be observed, that it emerges from the heart at the lower margin of the third rib, that it is elevated to the lower margin of the first rib, that its exterior and right side corresponds with the middle of the cartilages of the ribs; and its left side, which is covered by the left lung, with the extremities of the bony parts of the ribs.

From the ARCH of the AORTA proceed 1) the TWO CORONARIÆ CORDIS, *the right and in-*

ferior, the left and superior, which being given off above the interior and posterior semilunar valves, form an acute angle with the trunk; 2) ARTERIA SUBCLAVIA DEXTRA, or INNOMINATA 3) CAROTIS COMMUNIS SINISTRA 4) SUBCLAVIA SINISTRA. The last three branches are given off from the greatest convexity of the arch. The INNOMINATA ascends obliquely to the right, and crosses the trachea; at the right side of which, after a course of about two inches, it divides into the CAROTIS COMMUNIS DEXTRA, and SUBCLAVIA DEXTRA PROPRIA; the third and fourth branches arise from the aorta near the second, and resemble the two branches of the second.

I. ARTERIA CORONARIA DEXTRA INFERIOR, is larger than the left, and passes between the right auricle and ventricle, covered by fat, to the flat surface of the heart, communicating with the left artery, both by its branches, and by the termination of its trunk; it distributes the following branches:

a) Branch going to the aorta on the right, to the pulmonary artery on the left side:

b) Several branches to the two surfaces of the right auricle and the venæ cavæ, posteriorly to the sinus, the aorta, and the pulmonary veins:

c) Five branches to the convex surface of the heart. The longest of these anastomoses across the septum, and near the apex with the branches of the *left coronary artery:*

d) Branches distributed to the flat surface and right ventricle, as far as the apex.

II. Arteria coronaria sinistra superior, passes between the pulmonary artery and left auricle, and divides into two branches.

a) The *anterior branch* pursues a tortuous course along the convex surface of the heart, in the direction of the septum, to the apex, and then turns back to the flat surface. It sends

1) Branches to the trunks of the large arteries, communicating with the branches of the right coronary;

2) Numerous branches to the right ventricle.

b) *Posterior circumflex branch*, bends between the left auricle and ventricle towards the obtuse margin of the heart, to terminate on the flat surface. It gives off

* Branches which ascend to the left auricle, and ramifying extensively, terminate on the vena cava inferior.

** Branches to the left ventricle.

Observation. Sometimes the *left coronary artery* gives off a third branch, which dives deeply into the septum. The *coronary arteries* supply the flesh of the heart by innumerable branches, and communicate with the *phrenic, internal mammary, and bronchial arteries.*

III. SUBCLAVIA DEXTRA ET SINISTRA, will be described hereafter.

IV. CAROTIS COMMUNIS is somewhat smaller on the left side of the body than on the right, but its branches are distributed in the same way on both sides. It is situated on the front of the bodies of the vertebræ, and is connected with the intercostal nerve, par vagum, and internal jugular vein, by means of cellular substance. It ascends parallel with the trachea, to the superior margin of the thyroid gland, without giving off any branches: here it divides into two arteries of equal magnitude, the anterior of which is called the CAROTIS EXTERNA, the posterior the CAROTIS INTERNA, or CEREBRALIS.

DISTRIBUTION of the COMMON CAROTID.

I. CAROTIS EXTERNA OF SUPERFICIALIS, separates from the internal carotid, and, advancing a little forwards, almost immediately divides into eight branches.

1) *Thyroidea superior* goes off just at the commencement of the external carotid, and descends in a serpentine manner to the superior margin of the thyroid gland: it sends off

a) An *ascending superficial branch*, which passes either above or below the os hyoides, and forms an arch with its fellow on the opposite side; this distributes

α) Small branches to the hyothyroideus, sternohyoideus, platysma myoides, and the skin;

β) Similar branches to the ligament which connects the thyroid cartilage with the os hyoides.

b) A *descending superficial branch*, which passes downwards, and divides into many small branches communicating variously with each other: these are

1) Branches to the sternomastoideus, platysma myoides, thyroid cartilage, hyo and cricothyroideus, and the constrictores medii et inferiores of the pharynx. Some of these are occasionally given off by the former branch.

2) Branch anastomosing with its fellow of the opposite side above the cricothyroideus.

c) *Laryngeal branch*, which is often produced by the *ascending superficial branch*. It passes with the recurrent nerve between the cricoid and thyroid cartilages, to supply the interior parts of the larynx; sometimes it penetrates the membranous connexion of the thyroid cartilage and os hyoides, or else it enters by an hole adapted for it in the thyroid cartilage: it sends off

α) An *ascending* branch, to the upper part of the epiglottis and its membranes;

β) A *transverse* branch, to the arytenoidei and cricoarytenoidei posteriores;

γ) A *descending* branch, to the thyroarytenoidei, cricoarytenoidei laterales & posteriores.

The trunk afterwards passes out of the larynx, and terminates in the cricothyroideus.

d) *The proper thyroid branch*, which supplies the substance of the gland, and communicates with the *ramus thyroideus thyroideæ inferioris*, and with its fellow of the opposite side.

II) *Lingualis*, or *sublingualis*, pursues a serpentine course to the tongue, passing upwards, forwards, and inwards, above the os hyoides. Sometimes it passes across the hyoglossus, sometimes under it; it is then hidden by the genioglossus. At the front edge of the hyoglossus it divides into ε and ζ.

α) Branches to the constrictores medii of the pharynx.

β) *Hyoidean* branch, communicating with the same artery of the opposite side, above or below the os hyoides, and sending small twigs to the adjacent muscles of the os hyoides and tongue.

γ) Branches to the mylohyoideus, genio sterno and omohyoideus, and digastricus.

δ) *Dorsalis linguæ* is given off near the insertion of the styloglossus. It passes upwards and outwards to the dorsum of the tongue and epiglottis, and its branches extend to the pharynx.

ε) *Sublingualis* may be accounted the superficial branch of the divided trunk: it ascends between the sublingual glands and geniohyoideus to the chin, and having penetrated the mylohyoideus, is lost on the skin of the chin. Sometimes it is larger than usual, and then it supplies the place of the *submental artery;* in its course it gives off various small arteries to the sublingual gland, to the geniohyoideus, mylohyoideus, digastricus, and skin of the lower lip.

ζ *Ranina* is the most important branch. It departs from the trunk at an obtuse angle, and runs along the fibres of the genioglossus, to the surface and apex of the tongue, occupying the middle of the lower surface of that organ.

III) *Labialis* or *maxillaris externa*, or *angularis* or *facialis*, is covered at its origin by the stylohyoideus and tendon of the digastricus:

it rises in a tortuous manner through a groove formed in the submaxillary gland; then turns over the basis of the lower jaw, and follows the direction of the anterior edge of the masseter. Lastly, it extends by serpentine turns under the zygomatic muscles, along the side of the mouth and nose. Its numerous branches may be conveniently arranged into two orders; the first comprehending those arteries which are sent off before the trunk reaches the jaw (viz. from 1 to 6); the second, those which are distributed to the face (from 7 to 12).

1) *Palatina ascendens* is covered by the styloid muscles, and reaches the pharynx, near the external border of the internal pterygoid muscle. Having distributed small twigs to the styloid muscles, tongue, tonsils, and Eustachian tube, it divides near the side of the levator palati, into

* The *superficial palatine branch*, which follows the course of the circumflexus palati, and supplies the soft palate and its glands:

** The *deep-seated palatine branch*, which perforates the soft palate, and supplies the uvula, palate bone, expansion of the circumflexus, and the tonsils.

2) Branches of little consequence to the stylohyoideus, stylopharyngeus, and hyoglossus.

3) *Tonsillaris*. This artery, which is sometimes wanting, passes near the insertion of the styloglossus, to the side of the pharynx, as far as the tonsils, and terminates by many small branches distributed on their surface, and extending even to the tongue.

4) A *fasciculus of small branches* supplying the submaxillary glands, and continued to the tongue, the skin of the neck and chin, and the masseter.

5) *Pterygoid branch*, which is distributed to the pterygoideus internus, the mylohyoideus, the constrictores superiores, and the constrictor isthmi faucium.

6) *Submentalis* departs from the trunk near its turn over the jaw, and proceeds between the anterior portion of the digastricus, the mylohyoideus, and the margin of the jaw, nearly to the symphysis of the chin, where it divides into β and γ. Its branches are very numerous, when it supplies the place of the *sublingualis*, but ordinarily they are as follows:

α) Many twigs to the glands, skin, mylohyoideus, and the bone;

β) A *superficial branch*, distributed to the *depressor labii inferioris* and skin;

γ) A *deep-seated branch*, covered by the depressor labii inferioris, and supplying the levator menti, the depressor anguli oris, orbicularis and skin, and communicating with the *labialis inferior*.

7) *Masseteric branch*, which inosculates with a similar branch of the *temporalis*, on the surface of the masseter.

8) *Labialis inferior* or *superficialis*: proceeding forwards from the trunk, it distributes small twigs to the buccinator, depressor anguli oris, and labii inferioris proprius, anastomoses with the same artery of the opposite side, with the *coronaria inferior*, and *maxillaris inferior*, and terminates in the lower lip, sometimes producing the *coronaria labii inferioris*.

9) Small branches, ramifying on the buccinator, and communicating with the *transversalis faciei*, the *buccalis*, and *alveolaris*.

10) *Coronaria labii inferioris* arises near the corner of the mouth, is covered by the depressor anguli & orbicularis, and pursues a transverse and tortuous course upon the membrane of the mouth, till it meets with its fellow of the opposite side, with which it inosculates: it distributes

1) Branches to the masseter, the parotid gland and its duct, the buccinator, and orbicularis.

2) Branches descending to the depressor labii inferioris and skin, communicating with the adjacent arteries.

11) *Coronaria labii superioris* resembles the former, except that it is larger, and more tortuous. Passing under the zygomaticus major & orbicularis, it follows the edge of the upper lip: it sends

1) Branches to the orbicularis and elevators of the upper lip;

2) *Nasalis lateralis*, forming a beautiful net-work on the ala nasi, by means of its communications with the nasal branch of the *ophthalmica*.

3) Two *nasales septi*, which proceed to the very point of the nose.

12) Two or three branches given off under the levator labii superioris proprius, and communicating with the *infraorbitalis* and *palpebrales*.

IV) *Pharyngea ascendens Halleri*. This artery proceeds from the back part of the trunk, near the *lingualis*, or from the very bifurcation of the common carotid. It is the smallest branch of the carotid, except the *auricularis*. It ascends on the rectus capitis major anticus, to the foramen lacerum anterius, through which it passes, to terminate on the dura mater. The situation of its branches affords an opportunity of dividing them into

1) Those which turn inwards, which are

a) The *inferior pharyngeal branch*, which descends to the lower part of the fleshy bag of the pharynx;

b) The *middle pharyngeal branch* supplies the middle of the pharynx, and communicates with the *thyroidea superior*;

c) *Superior pharyngeal*, or *palatine branch*, sends twigs to the constrictores superiores, stylopharyngeus, Eustachian

tube, and soft palate; others to the rectus minor, os occipitis, internal nares, and pterygoid canal.

2) Those which turn outwards; of which may be remarked

α) Branches to the first intercostal ganglion and par vagum;

β) Branches to the sternomastoideus, and conglobate glands of the neck;

γ) Branch entering the skull with the jugular vein, and distributed to the dura mater, as far as the cavernous sinus.

V) *Occipitalis* goes in front of the jugular vein, lies upon the rectus lateralis, and between the transverse process of the atlas, and the mastoid process of the temporal bone, till it arrives at the ligamentum nuchæ, when it is distributed to the back of the head by widely spreading branches. In this course it is first covered by the digastricus, the trachelomastoideus, the splenius, and complexus; but it afterwards becomes cutaneous. It sends off the following arteries:

a) Branch to the digastricus and stylohyoideus;

b) Branches to the jugular glands, and sternomastoideus, inosculating with the *thyroidea ascendens*;

c) *Meningeal branch*, entering the skull at the foramen jugulare, and distributed to the dura mater of the cerebellum;

d) Auricular branch, supplying the back part of the external ear;

e) Branches to the splenius and trachelomastoideus; these send twigs to the recti laterales & obliqui.

f) *Art. princeps cervicalis* descends along the outer margin of the complexus, between that muscle and the trachelomastoideus: it divides into

*) A superficial branch, which often descends to the middle of the neck, and, giving twigs to the splenius, complexus,

and skin, communicates with the *transversalis colli* of the *thyroidea infer.*

**) A deep-seated branch, distributed to the obliqui, recti, and complexus, and connected with the *vertebralis* under the transverse process of the atlas.

g) Retrograde branches to the splenius and complexus. The branches of the occipital artery spread widely over the vertex of the head, and inosculate with the *temporalis*. One of them perforates the crucial spine of the occiput, and another the posterior mastoid hole, to be distributed to the dura mater.

VI) *Auricularis posterior*, or *stylomastoidea*, passes transversely to the ear, from the back part of the carotid artery, being situated above the digastricus, and in front of the styloid process. It then turns towards the fold between the ear and the head, and bends along the posterior part of the temporal bone, meeting with the *temporalis* and the *occipitalis*. It sends

a) Several branches to the parotid, digastricus, aud sterno-mastoideus:

b) A branch in infants entering the meatus auditorius by means of a particular foramen, and distributed to the membrane of the meatus:

c) *Stylomastoidea* passes through the foramen of that name: it gives off

1) An external branch to the cartilaginous meatus;

2) An artery, which meeting with a twig of the *articularis maxillæ* forms a *coronary artery*, surrounding the bony part of the meatus auditorius, and sending branches which ramify beautifully on the membrana tympani.

3) Branches to the mastoid cells, muscle of the stapes, external semicircular canal, and the auditory nerve;

4) A branch anastomosing at the upper and back part of the tympanum with the meningeal branch, which arrives through the hiatus Fallopii.

d) Small branches to the sternomastoideus, splenius, retrahens auris, pericranium, and os occipitis :

e) Branch distributed over the convex surface of the concha, and anastomosing with the *auricularis anterior.*

f) Branches extending more widely above and beneath the temporal aponeurosis, communicating with the *temporalis* in front, with the *occipitalis* behind.

VII) *Temporalis superficialis* ascends between the meatus auditorius and the jaw, deeply imbedded in the substance of the parotid : it passes over the zygomatic arch, and distributes its branches in every direction over the side of the head. In this course it gives off

1) Several branches to the parotid, varying in size and number :

2) *Articularis maxillæ* goes to the back part of the meatus auditorius. It supplies the capsule of the joint, and sends two branches through the fissure of the articulation, to supply the muscle of the malleus, and to communicate with the above-mentioned branch of the stylomastoidea.

3) *Massetericæ,* two or three in number ; they supply the muscle of that name, and communicate with the *coronaria lab. infer. & buccālis :*

4) *Transversalis faciei* is given off within the parotid, whence it proceeds to the face in company with the parotid duct, giving branches to the parotid, to the articulation of the jaw, the masseter, the skin, the zygomaticus and orbicularis palpebrarum. It inosculates with the *alveolaris palpebralis, infra orbitalis, & coron. lab. super.* Sometimes it produces the *Massetericæ.*

5) *Temporalis media*, or *profundior*; passing over the zygomatic arch, it is immediately covered by the aponeurosis; it extends to the front of the fronto-occipitalis, and anastomoses with the *palpebralis* at the external angle of the eye.

6) *Auriculares anteriores* are given off above the *temporalis media*; they supply the front of the external ear, the anterior auris, and the meatus auditorius.

7) *Orbicular branch*, which often proceeds from the *temporalis frontalis*. This artery is given off after the *temporalis* has mounted over the zygomia; it proceeds to the external angle of the eye, and then extends, under the orbicularis, as far as the internal angle. In this course it anastomoses with the *palpebralis* and *frontalis*, and forms with the latter the *superciliary arch*.

8) *Temporalis frontalis*, or *interna*, or *anterior*, ramifies widely over the forehead; it sometimes extends even to the nose, supplying the orbicularis, corrugator, frontalis, and aponeurosis of the frontalis.

9) *Temporalis occipitalis*, or *externa*, or *posterior*, bends towards the back of the head, and seems to be the continuation of the trunk. Its branches, which vary infinitely, supply the occiput and sides of the head. It inosculates in front with the *temporalis frontalis*; behind with the *occipitalis*, about the lambdoidal suture; and on the top of the head, with the same arteries of the opposite side.

Observation. The *temporalis* sends many numerous twigs to the pericranium and bone.

VIII) *Maxillaris interna*, which is larger than the *temporalis*, generally arises at about the middle of the ramus of the lower jaw; from this situation it turns inwards, forwards, and downwards, in front of the pterygoideus ex-

ternus, and hidden by the jaw. Here it begins to bend upwards, and arrives, in a wonderfully tortuous manner, at the spheno-maxillary fissure, where it divides into three or four branches: in its course it sends off

1) *Auricularis profunda* for the supply of the back part of the meatus auditorius, and the adjacent glands; it is sometimes wanting.

2) *Tympanica* passes through the fissura Glasseri to supply the anterior muscle of the malleus.

3) *Meningea parva* passes between the pterygoid ala, and the circumflexus palati, to theforamen ovale, through which it enters the skull, and penetrates to the dura mater of the cavernous sinus.

4) *Meningea media* ascends in a straight course through the foramen spinosum, and is immediately distributed over the dura mater; some of its branches pass towards the occiput, others ascend to the falciform sinus, and others are distributed on the front of the dura mater. All these communicate with each other---with the posterior meningeal arteries, given off from the *vertebralis* and *occipitalis*---and with the anterior ones, which arise from the ophthalmic. Before it arrives at the foramen spinosum, it sometimes gives branches to the sphenoid bone and the pterygoideus externus. After passing the foramen, it sends off

*) Three or four branches to the conjunction of the petrous and squamous parts of the temporal bone;

**) Two branches entering the aquæductus Fallopii: one of them follows the course of that canal; the other goes to the internal muscle of the malleus, and the cavity of the tympanum.

***) Branches penetrating through some small holes of the sphenoid ala, to the os malæ and lacrymal gland.

The *meningea* sometimes produces the *art. lacrymalis* within the cranium.

5) *Maxillaris inferior* enters the canal of the lower jaw, in company with the nerve of the same name, having previously given some insignificant branches to the pterygoideus internus, and mylohoideus. Its posterior branches supply the dentes molares and bone itself; the anterior branches penetrate the sockets of the incisores. It quits the canal at the foramen mentale, and appears upon the face, anastomosing with the labial arteries, and contributing to the supply of the lip.

6) *Pterygoid branches* for the supply of the pterygoid and buccinator muscles; their number varies.

7) *Temporalis exterior profunda* ascends to supply the substance of the temporal muscle, being given off before the trunk is covered by the zygoma. The pterygoideus ext. and masster also receive some of its twigs.

8) *Temporalis profunda interior* departs from the trunk, near the antrum Highmorianum, and is soon lost in the temporal muscle.

9) *Buccalis* varies much in its origin, being sometimes produced by the *temporalis prof. exter.* the *alveolaris*, or the *infraorbitalis*; it penetrates to the buccinator, and is distributed to that muscle, as well as to the zygomaticus, levator lab. super. proprius, glands, and fat. Sometimes it produces alveolar branches.

10) *Alveolaris* is situated on the superior maxillary bone, and pursues a tortuous and transverse course towards the face: it sends off

a) Branches to the buccinator, fat, gums, and bone.

b) Branches penetrating the antrum Highmori by very small holes.

c) *Dentalis maxillæ superioris*, which enters the canal of the upper jaw, and supplies all the teeth of that jaw.

11) *Infraorbitalis*, arising at the spheno-maxillary fissure; it sends small twigs to the dura mater and fat of the orbit, to the lacrymal gland and obliquus minor of

the eye. It enters and passes through the infraorbitary canal, and emerges on the face at the infraorbitary foramen. While in the canal it produces

*) Branches to the orbicularis, lacrymal sac, and nose.

**) Branches penetrating through the canal to supply the antrum and its membrane.

In the face it communicates with the *nasales*, *coron. lab. super.*, *transversalis faciei*, and *buccalis*, and gives twigs to the buccinator, levator anguli oris, and lab. super. proprius.

12) *Palatina superior*, or *descendens*, or *pterygopalatina*. This is one of the three arteries into which the trunk divides at the spheno-maxillary fissure; it enters the pterygopalatine canal, and there divides into two branches, which sometimes come off separately from the trunk of the *maxillaris interna*.

a) *Posterior branch* supplying the extremity of the palate bone, and the soft palate, and communicating with the *palatina ascendens*.

b) *Anterior branch* is the larger artery; it passes forwards under the arch of the teeth, and forms a vascular net-work on the palate. One of its branches ascends through the foramen incisivum to the interior of the nose.

13) *Pharyngea suprema* arises at the above-mentioned place, and extends behind the sphenoid cells to the upper and back part of the pharynx: it gives

α) Branches to the substance of the sphenoid bone.

β) Branch to the pterygoid duct, where it communicates with a twig of the *carotis interna*, *pharyngea ascendens*, or *meningea media*.

14) *Nasalis* may be considered as the termination of the trunk, and is sometimes double. It penetrates the sphenopalatine foramen, to supply the upper and back part of the nose: it distributes

a) Small twigs to the posterior ethmoidal cells, and to the sphenoidal sinuses.

b) Larger branches to the septum nasi, and to the bottom of the nostrils and antrum; the last communicates with the nasal branch of the palatine, which passes through the foramen incisivum.

II. Carotis interna, or cerebralis, in passing to the canal, which is formed for its reception in the petrous part of the temporal bone, is connected in front to the par vagum and intercostal nerve; behind, to the rectus anterior, by means of cellular substance: sometimes, however, it previously makes a larger or smaller turn on the vertebræ. During this course it gives off no branches, but enters the carotid canal, and, following its direction, makes several remarkable turns. First, the artery, on entering the canal, is propelled upwards, inwards, and forwards, so as to form an obtuse angle. Then it begins to be elevated upwards and forwards, out of the canal, at a very obtuse angle. Thirdly, being situated at the back of the sella turcica, it bends forwards, on the cavernous sinus, to the anterior clynoid process in an horizontal direction; afterwards, it ascends perpendicularly, perforates the inner layer of the dura mater, and turns back to supply the brain. During this its tortuous course, it

sends off the branches from I. to V. and afterwards the rest.

I) Branch to the pterygoid canal, communicating with the *pharyngea suprema* of the *maxillaris interna*.

II) Branch entering the cavity of the tympanum, and communicating with the twig of the *meningea*, which enters at the aqueduct.

III) *Arteria receptaculi posterior* is given off from that transverse part of the carotid which is contained in the cavernous sinus, and is distributed to the dura mater, which covers the posterior clynoid, and cuneiform processes, anastomosing with certain branches of the *vertebralis*, given off before that artery enters the skull.

a) Branches to the fourth, fifth, and sixth pairs of nerves, and to the pituitary gland.

b) Branches to the dura mater, and to the bone.

IV) *Art. receptaculi anterior*, which arises above the origin of the intercostal nerve. (Some anatomists, who attribute the origin of the intercostal nerve to the first branch of the fifth pair, have mistaken this artery for a nerve.)

α) Branches to the third, fourth, and fifth pairs.

β) Branches to the dura mater of the cavernous sinus, near the sphenoidal fissure, aud to the pituitary gland.

V) *Ophthalmica* arises near the anterior clynoid process, as the carotid is quitting the sphe-

noid bone, and enters the orbit at the foramen opticum, in company with, and covered by the optic nerve. At first it is situated on the outside of the nerve, then it crosses obliquely over the nerve, and, passing above the adductor oculi, it arrives at the internal angle of the eye, where it leaves the orbit, and divides into two branches. The branches which this artery gives off, and their subsequent divisions, will be enumerated in their natural order.

1) *Lacrymalis*, arising between the levator and abductor, and lying on the latter muscle, proceeds to the lacrymal gland: it is sometimes produced by the *meningea media*.

a) Branch reflected to the dura mater of the cavernous sinus:

b) Branches to the periosteum of the orbit:

c) Branches to the levator palpebræ, abductor, and optic nerve:

d) Many branches to the lacrymal gland.

e) *Tarsea externa inferior*, forming an arch with the *palpebralis inferior* on the lower eyelid.

f) *Tarsea externa superior*, forming a similar arch on the upper eyelid with the *palpeb. super.*

2) *Ciliaris externa longa*. All the ciliary arteries will be described together hereafter.

3) *Infraorbitalis*, or *muscularis superior*, arises as the artery is passing over the nerve; it passes forwards on the levator palpeb. and emerges on the forehead at the foramen supraorbitale, where it divides into two branches.

a) Branches to the obliquus major, lev. palpeb. rectus super. sclerotica & periosteum:

b) *Internal branch* widely distributed to the periosteum of the os frontis, and communicating with the *temporalis* and *frontalis:*

c) *External branch* is covered by the orbicularis, and gives twigs to that muscle, and to the corrugator, communicating freely with the neighbouring branches.

4) *Centralis retinæ* proceeds from the lower part of the trunk, sooner or later, as it passes over the nerve, or even from one of the *ciliary arteries*; it plunges into the nerve, and runs along its axis, beautifully ramifying on the inner surface of the retina. Some of its branches extend to the corpus ciliare, and form a circle between it and the vitreus humor, which sends vessels to the crystalline. Another of its branches runs along the centre of the vitreus humor to the back of the lens.

5) *Ciliaris interna longa.*

6) *Muscularis inferior* arises on the inner side of the optic nerve, and goes under the eye, as far as the lower eyelid.

a) Branches to the obliquus minor, the depressor, adducens, optic nerve, and sclerotica:

b) Branches to the periofteum of the orbit, communicating with the *infraorbitalis:*

c) Branches to the lower eyelid and conjunctiva.

7) *Ciliaris inferior* is sometimes wanting.

The *three ciliary arteries*, which have been already mentioned, and which have the names of *externa*, *interna*, and *inferior*, take their origin from the *ophthalmica* itself, in such a manner that they follow the direction of the external, internal, and lower parts of the optic nerve in a serpentine manner. But there are sometimes six trunks of *ciliary arteries*, which do not all arise from the *ophthalmica* itself, but from its nearest branches, and which perforate various parts of the sclerotica, previously dividing into smaller branches. They may be divided into three classes:

1) *Art. ciliares breves*, or *posteriores*, are often thirty in number, arising from the *muscularis superior* and *inferior*, and the *ethmoidalis*, and perforating the sclerotica near the optic nerve to supply the back of the choroid.

2) *Ciliares longæ;* these are two in number, perforating the sclerotica at one-third of the distance between the optic nerve and cornea: at the orbiculus ciliaris they divide into two branches, which follow the outer circle of the iris.

3) *Ciliares anteriores* arise from the *musculares*, or the *ophthalmica* & *palpebrales*, accompany the recti muscles, and divide into three or four branches at a small distance from the cornea, to perforate the sclerotica, and to be distributed among the long vessels in the uvea. These arteries altogether form a wonderful vascular net-work, to which the choroid coat, the ciliary body and its processes, and the iris, owe their origin.

8) *Ethmoidalis posterior* passes between the levator and adductor, and over the obliquus major to the posterior orbitary hole. It penetrates that hole, and the cribriform lamella of the ethmoid bone, to be distributed to the neighbouring part of the dura mater. The continuation of the trunk is distributed to the interior of the nostrils.

a) Branches to the frontal sinus, to the anterior ethmoid cells, and front of the nares, where they communicate with the other nasal arteries.

b) Branches to the dura mater and falx.

9) *Palpebralis inferior* generally arises by a common trunk with the *superior*, where the artery leaves the tendon of the obliquus major.

α) Branch to the commissure of the eyelids, caruncula, lacrymalis, and tunica conjunctiva:

β) Branches to the anterior ethmoid cells, communicating with the *ethmoidea anterior*, and to the lacrymal sac:

γ) Branch contributing with the *lacrymalis*, to form the inferior tarseal arch.

10) *Palpebralis superior.*

1) Branches to the upper part of the orbicularis, to the ligament of the eyelids, and the caruncula.

2) Branch forming the superior tarseal arch with the *lacrymalis.*

11) *Nasalis* extends across the upper part of the lacrymal bag to the nose.

a) Branch to the frontal muscles and skin.

b) Branch to the lacrymal bag, extending to the orbicularis muscle, and communicating with the *infraorbitalis.*

c) Branch to the side of the nose, contributing to the beautiful net-work which is there formed; perforating the bone and cartilage of the nose, it terminates on the membrana pituitaria.

12) *Frontalis* generally divides into three branches:

α) *Superciliaris* supplying the muscles of the eyebrow, and communicating with the *temporalis* and *lacrymalis*;

β) *Frontalis superficialis* is widely distributed over the os frontis, extending even to the coronal suture, and communicating with the *temporalis nasalis*, and supraorbitalis;

γ) *Frontalis profunda* partly supplies the corrugator and orbicularis, and partly the pericranium.

VI) Small branches to the optic nerve, infundibulum, pituitary gland, and bottom of the choroid plexus.

VII) *Art. communicans* forming the *circle of Willis* with the *ramus cerebri profundus* of the *vertebralis.* It bends backwards, and inwards, by the side of the corpora mamillaria, and near the infundibulum, where it meets with the above-mentioned artery, and forms with it an obtuse-angled quadrangle. It sends

a) Branches to the eminentiæ mammillares, infundibulum, and optic nerves.

b) Branches to the crura cerebri, communicating with the *carotis posterior.*

VIII) *Carotis anterior*, or *callosa*, is one of the two almost equal branches, into which the *internal carotid* divides into that part where the anterior lobe of the brain is separated from the posterior. It immediately passes inwards and forwards, and bends above the corpus callosum, and between the hemispheres towards the posterior lobe of the brain. It gives off

α) Branches to the optic and olfactory nerves;

β) Several branches passing outwards to the front lobe of the brain;

γ) *Art. communicans* is short and transverse, and communicates with its fellow of the opposite side. Its branches go to

† The anterior end of the third ventricle, to the fornix, anterior commissure, and septum lucidum.

†† The pia mater, which covers the neighbouring parts.

δ) Branches to the inner and lower surfaces of the anterior lobe. They follow the convolutions of the brain, and penetrate deeply into the cortical substance. They inosculate variously with the *carotis posterior.*

IX) *Carotis posterior*, or *sylvianæ fossæ*, enters the fossa sylvii, and gives numerous superficial and deep-seated arteries to both lobes of the brain: of those branches may be remarked

a) Branches to the optic nerve and choroid plexus;

b) Branches to the pia mater of the basis of the brain;

c) Branches inosculating with those of the former trunks, and also with the branches of the vertebralis.

DISTRIBUTION of the SUBCLAVIA and its BRANCHES.

The right and left arteries both distribute the same branches; but they differ from each other in one respect: for the *subclavia dextra* being much the largest, crosses obliquely before the trachea, and gives origin to the *carotis dextra*. After this division the proper *subclavia dextra* pursues its course almost in a transverse direction. The left artery arises from a more sloping part of the arch, and makes a larger and more acute turn down to the axilla.

The artery goes above the upper margin of the first rib, in such a manner as to be hidden by the clavicle; then it passes transversely between the first and second scalenus, with the brachial plexus of nerves; and, lastly, it bends into the axilla, protected by the broad extremity of the clavicle, and the pectoral muscles, where it receives the name of *axillaris*. The branches of the subclavian, and their subdivisions, offer to the anatomist an infinite number of varieties, insomuch that descriptions seldom accord with nature in every respect, being erroneous either in the number of branches, or in their course.

Usually, however, the artery sends off the first four branches previous to its passing under the scalenus, and the rest afterwards.

I) *Mammaria interna* is produced from the front and lower part of the artery, at the very apex of the pleura; it ascends gradually, bends down again towards the sternum, and passes the border of the first rib. It holds a middle course along the internal surface of the cartilages of the rib before the pleura, and between the intercostal and sternocostal muscles, to the diaphragm. It is afterwards lost in the rectus muscle. It sends

a) Retrograde branch to the muscles of the neck.

b) *Thymica*, which is sometimes double, and varies much in its distribution to the gland.

c) *Comes nervi phrenici* is a very small branch, descending with the phrenic nerve, and communicating on the diaphragm with the *phrenic branch* of the *aorta*.

d) *Pericardiaca posterior superior*, which sometimes arises from the *subclavian*, from the *aorta* or *carotid*, supplies the upper and back part of the pericardium, the bronchia, and surrounding glands, and even extends to the œsophagus.

e) *Mediastinæ*, arising between the third and sixth ribs. Some go to the thymus, and one to the diaphragm.

f) Branches ramifying on the posterior surface of the sternum.

g) Minute branches to the pericardium, and to the glands which lie on the vena cava.

h) Branches to the neighbouring surface of the lungs.

i) Branches going out at the intervals between the six upper ribs, and distributed to the intercostal and pec-

toral muscles, to the mamma, and obliquus descendens, and anastomosing with the thoracic and intercostal arteries.

k) *Phrenico-pericardiaca*, descending over the pericardium to the diaphragm, and sometimes extending to the rectus muscle.

l) *Musculo-phrenica* is a large branch proceeding outwards, anastomosing with the *intercostales inferiores* at the seventh, eighth, and ninth ribs; and distributed to the diaphragm and transversalis abdom. as far as the tenth rib.

m) Branch ramifying on the ensiform cartilage, uniting with its fellow, and sometimes descending to the rectus.

n) *The epigastric branch* is the continuation of the trunk, leaving the thorax at the seventh rib, near the ensiform cartilage, and covered by the abdominal muscles: it divides into

α) *An internal branch* descending on the rectus, as far as the navel, and communicating with the *epigastrica*;

β) *An external branch* communicating with the *epigastric, intercostal* and *lumbar arteries* on the transversalis. It is sometimes given off by the *musculo-phrenica*; and where that artery is small, its branches are more numerous.

II) *Thyroidea inferior*, or *cervicalis anterior*, is covered at its origin by the sternomastoideus: it arises from the front of the artery, and, bending upwards and outwards, soon separates into four branches; which are

1) *Transversalis scapularis*; this is the lowest branch of the thyroid: sometimes it is a large artery, covered at its commencement by the sternomastoideus, and passing across the neck to the scapula, when it gets under the trapezius. Sometimes the *cervicalis superficialis* produces the *scapularis superior*, when this artery is small.

a) Branches to the sternomastoideus, sterno and omohyoideus and subclavius.

b) *Scapularis superficialis* to the surface of the trapezius and deltoid, and to the skin of the shoulder.

c) Branches to the levator scapulæ, serratus, and trapezius.

Sometimes the artery, having sent off these branches, descends more deeply under the trapezius, being of a larger size and more serpentine course than usual; and, taking the name of *scapularis superior*, or *dorsalis scapulæ*, divides into two principal trunks: but first it sends off

α) Branches to the trapezius, serratus anticus, and rhomboides;

β) Branches on the surface of the supraspinatus, communicating under the acromion with the *thoracica thermeraria* of the *axillaris*, and at the superior angle of the scapula with the *superficialis baseos scapulæ*;

γ) Branch paſſing over the spine of the scapula, and communicating with the *circumflexa* of the *scapularis inferior*, having previously given branches to the bone and neighbouring muscles.

Under the trapezius the artery divides into

a) *Superspinalis*, which passes through the notch of the scapula, and gives off many branches to the supraspinatus; then descends under the acromion to the lower part of the scapula, where it supplies the capsule of the shoulder-joint, the infraspinatus and teres minor, and, lastly, communicates with the *circumflexa scapularis inferioris*.

b) *Superficialis baseos scapulæ* goes off near the lower part of the levator to the basis of the scapula, along which it descends, between the serratus major and rhomboides, to the lower angle of the scapula. In its course it distributes numerous branches to the rhomboides and serratus, and through those muscles to the trapezius, serratus posterior and subscapularis: Lastly, the trunk anastomoses in a very beautiful manner, at the inferior angle of the scapula, with the *scapularis inferior*, on the surface of the serratus.

Thus, therefore, the *scapularis superior* of the *thyroidea* generally produces the two last-mentioned arteries: sometimes, however, it only produces the *superspinalis*; in which case, the other arises from the *cervicalis superficialis*.

2) *Transversalis colli*, takes a transverse course along the side of the neck, till it is covered by the trapezius; its branches are sometimes supplied by the *cervicalis superficialis*.

a) Branches to the sternomastoideus and skin;

b) Branches to the trapezius, levator scapulæ, and splenius, one of which anastomoses with the *princeps cervicalis* of the occipitalis.

c) Descending muscular branch to the trapezius, rhomboides, complexus, and supraspinatus, anastomosing with the *cervicalis superficialis* and *transversalis scapularis*.

3) *Thyroidea ascendens*, ascends in front of the transverse processes of the vertebræ, between the rectus anterior and the scaleni, to the second vertebra; varying in its size, and in the number of its branches: it sends off

†) Superficial branches; of which may be remarked,

a) Branches to the lev. scap. splenius colli, sternomast. scaleni, and rectus ant.

b) Branches to the suboccipital nerves, and great cervical ganglion.

††) Deep-seated branches which are lost between the vertebræ in the ascent of the artery:

a) Branches to the intertransversales, scaleni post. and origin of the splenii;

b) Branches penetrating the coverings of the spinal marrow, and communicating with the *vertebralis*.

4) *Ramus thyroideæ thyroideus* is the termination of the artery, which bends under the carotid, at the side of the larynx, and, by repeated contortions, arrives at the lower extremity of the thyroid gland: it plunges

into the substance of the gland, and inosculates with its other arteries.

1) Small branches to the muscles of the os hyoides and larynx, and to the upper part of the trachea.

2) Branches to the constrictores inferiores of the pharynx, to the œsophagus and posterior muscles of the larynx.

3) *Trachealis superior*, or *thoracica*, descends with the trachea into the chest, and communicates on it in a very beautiful manner with the bronchiales inferiores, and *intercostalis suprema*; there are sometimes two or three of these arteries.

III) *Intercostalis superior* arises from the upper and back part of the trunk, more externally than the *vertebralis*; it passes backwards to the hollow formed by the scalenus ant. and first rib on one side, by the bodies of the vertebræ on the other, and then suddenly turns downwards, so as to descend along the heads of the first and second ribs into the thorax. In this course it produces

a) Ascending branches to the scaleni, longus colli, and nerves.

b) Branches following the edges of the first and second ribs, supplying the intercostal muscles, and communicating with the *thoracica suprema* and *mammaria interna*.

c) Œsophageal branches, communicating with the *trachealis sup*. of the *thyroidea*.

d) Branches distributed to the spinal marrow and its coverings.

e) Branches communicating with the *intercostalis inferior prima*, over the third rib.

f) Deep-seated branches penetrating to the muscles of the back and neck.

IV) *Vertebralis*, is larger than any of the preceding arteries, and arises from the upper part of the *subclavia*. It is covered by a cellular substance, and by the ganglia of the intercostal nerve in its ascent to the foramina of the transverse processes of the cervical vertebræ. It enters these holes at the sixth, fifth, or fourth vert. and proceeds in a straight course to the first. In order to pass through the transverse process of the first vert. it makes a great turn outwards; then again it suddenly bends backwards and inwards, so as to pass transversely to the foramen magnum, along the groove in the atlas, which is destined to receive it. Entering the cranium at this foramen, it is propelled forwards and upwards along the basilar process, and under the medulla oblongata, to meet the artery of the opposite side at an acute angle. The two trunks uniting, form the basilar artery, which is distributed to the cerebrum and cerebellum.

1) Small branches to the muscles, which are situated near to the vertebræ;

2) Larger branches to the spinal marrow, communicating with the *spinalis anterior & posterior*;

3) Branch given off from the first turn of the artery to the recti & obliqui, the trachelomast. & complexus; this communicates with the *occipitalis*;

4) *Posterior meningeal branches* arising from the second and third turnings of the artery; extending in front as far as the clynoid processes, ramifying behind on the occiput.

The vertebral produces the following branches within the cranium, and before the formation of the basilar.

5) *Inferior cerebelli*, which arises from the trunk at a right angle, between the suboccipital and the accessory nerves, and near the medulla oblongata. Having distributed many branches to the lower surface of the cerebellum, it passes between the crura cerebelli and the medulla oblongata, and bends backwards and upwards, so as to terminate in the vermis cerebelli and fourth ventricle. It distributes

1) Branches to the eighth pair of nerves:

2) Branches to the front and sides of the medulla oblongata, to the front of the corpora olivaria, and to the choroid plexus of the fourth ventricle.

6) Branches to the groove, which separates the corpora pyramidalia from the tuber anulare:

7) *Spinalis posterior* is often produced by the *art. cerebelli inferior*. It bends from the front to the back part of the medulla oblongata; descends in a tortuous manner on the medulla spinalis, frequently communicating with its fellow, and with the branches that enter the spinal canal through the foramina, at which the nerves pass out. It terminates on the surface of the medulla, at the second lumbar vertebra.

8) *Spinalis anterior* quits the trunk near the formation of the basilar artery, at an acute angle; takes a retrograde course along the front of the med. spin. forming frequent transverse communications with the artery of the opposite side. Near the termination of the medulla, the two arteries unite into one trunk, which descends to the apex of the os sacrum, and has the appearance of a nerve when empty: and hence arose the false ideas of the ancients concerning an azygous nerve. It gives many branches to the adjacent parts, and to the spinal nerves, and frequently communicates with the arteries that enter the spinal canal.

The basilar artery fills the middle depression of the tuber annulare, and, at its anterior part, divides into four parallel branches; of which the two posterior ones go to the cerebellum, the two anterior to the cerebrum, contributing to form the circle of Willis.

a) Branches to the surface of the medulla oblong. to the corpora olivaria & pyramidalia, to the tuber annulare, and lower surface of the cerebellum, and also the neighbouring nerves. One branch accompanies the seventh pair into the labyrinth of the ear.

b) *Profunda cerebelli* bends round the crura cerebri to the upper part of the cerebellum, and there produces

†) An *anterior* branch to the crura cerebelli, the vermis, and the choroid plexus of the thalami:

††) A *middle* branch, which supplies the upper part of the cerebellum, and communicates freely with the *inferior cerebelli*; it also gives branches to the thalami, the tubercula quadrigemina, and the pineal gland:

†††) A *deep-seated* branch, which follows the same course, and supplies the crura cerebri, the thalami, the tuberc. quadrig. pineal gland, and the fourth ventricle.

c) *Profunda cerebri.* This artery is of greater magnitude than the former, and is separated from it by the nerve of the third pair. It passes upwards between the cerebellum and the back lobe of the cerebrum. It sends off

1) Small branches to the inferior surface of the brain.

2) *Art. communicantes.* They pass forwards at almost a right angle to meet the *art. communicantes* of the carotids, and thereby to complete the circle of Willis.

3) Branches to the sides of the crura cerebri and lateral ventricle; to the tuberc. quadrig. pineal gland, and choroid plexus, which covers those parts; to the fornix, corpora striata, and third ventricle.

4) Branch passing back to the posterior lobes of the brain, and extending to the corpus callosum and septum lucidum.

V) *Cervicalis profunda*, or *posterior*, is an artery of uncertain origin, magnitude, and extent, as the *cervicalis superficialis* or *transversalis scapularis* are larger or smaller. Ordinarily it arises from the subclavian, as it passes from under the scalenus, or a little before. The artery bends upwards aud backwards beneath the muscles of the neck, and distributes its last branches on the complexus: it gives the following branches:

a) Branches playing on the surface of the vertebræ;

b) Branches to all the scaleni;

c) Branches to the spinalis colli, trachelomastoideus, splenius and complexus, which communicate with the *occipitalis*.

VI) *Cervicalis superficialis*, arising about half an inch or an inch from the scalenus primus, from the upper and front part of the artery, it is immediately hidden amongst the brachial nerves. Emerging, however, at the superior costa of the scapula, it divides into several very varying branches: of those may be remarked,

†) Branches distributed to the scaleni and brachial nerves;

††) Transverse branch, which ascends under the levator scap. giving superficial branches to that muscle, to the trapezius and skin, and more deeply-seated ones to the splenius and complexus. When it is larger than usual, it produces the *superspinalis*, or *superficialis baseos scap*. It inosculates freely with the *thyroideæ* and *cervicalis profunda*.

The *subclavian artery*, quitting its former situation, turns down to the shoulder, between the breast and scapula, and assumes the name of AXILLARY. Where it emerges from under the clavicle, it is covered by the brachial plexus of nerves, by the axillary glands and veins, and by a large quantity of fat. It is situated deep in the axilla, between the subscapularis and serratus major, but soon approaches to the inner margin of the biceps, protected externally by the pectoral muscles. Arriving at the lower margin of the tendon of the latissimus dorsi, it again changes its name for that of *Humeraria*. *The axillary gives off the following branches:*

I) Small branches to the scalenus, first rib, coracoid process, adjacent nerves, and muscles:

II) *Thoracica suprema* arises above the second rib, or at the lower margin of the first rib, and passes in front of the pectoralis minor. It divides into

†) An ascending branch, which is distributed to the serratus, and communicates with the *mammaria interna* and *intercostalis superior*:

††) Branch descending as low as the fifth rib, and communicating with the *thoracica longior*; it supplies the serratus magnus, the pectoral muscles, and the intercostal muscles of the second interspace, where it communicates with the *intercostalis superior* and *mammaria interna*.

III) *Thoracica longior*, or *superior*, or *mammaria*

externa, descends behind the pectoralis minor to the fifth interspace of the ribs: it is sometimes produced by the *circumflexa* or *scapularis inferior*.

α) Branches to the axillary glands and mamma.

β) Several branches to the serratus major and pectoral muscles, communicating with the *thoracica suprema*.

γ) Branches to the intercostal spaces, communicating with the *mammaria interna* and *intercostales infer*.

IV) *Thoracica humeraria*, or *tertia*, or *acromialis*, arises from the front of the trunk between the second rib and the coracoid process, and penetrates the interspace between the deltoid and pectoralis major. It produces

a) A deep-seated branch to the serratus major;

b) Branches to the deltoid, pectoralis major, and subclavius, which even ascend over the clavicle to the neck;

c) Branch descending near the coracoid process to the axillary glands;

d) *Circumflex branch*, bending backwards near the origin of the deltoid, and producing

†) A cutaneous branch, descending with the vena cephalica:

††) Superficial branch, following the outer edge of the deltoid and the margin of the acromion:

†††) Deep-seated branch to the capsule of the joint and deltoid:

††††) Branch to the spine of the scapula, communicating with the *superspinalis*, and with the *circumflexa posterior* of the axillary.

V) *Thoracica alaris*. This artery is sometimes wanting. Sometimes it is of a large size, and sends off numerous branches to the axillary glands, and some to the neighbouring muscles.

Observation. The number and distribution of the thoracic arteries vary so much that sometimes anatomists have enumerated six separate trunks sent off to the thorax.

VI) Two or more branches given off to the nerves, serratus, lev. scap., latiss. dorsi, and principally to the subscapularis, on which they communicate with the *superf. bas. scap.*

VII) *Scapularis inferior*, or *infrascapularis*, or *subscapularis*, is given off towards the lower part of the subscapularis, and divides into several large branches. It sometimes arises amongst the *thoracicæ*, and descends.

α) Branch to the surface of the subscapularis, the capsule of the shoulder joint, and the muscles inserted into the coracoid process:

β) Deep-seated branch, ramifying through the subscapularis, having previously given twigs to the teres major and latiss. dorsi:

γ) A muscular branch of great magnitude, and sometimes of a separate origin, sending arteries to the subscapularis, as far as the basis of the scapula; and also to the teres major, serratus, latiss. dorsi, and axillary glands:

δ) A branch which follows the lower margin of the subscapularis, turns round the lower and back part of the scapula, and inosculates with the *superf. bas. scap.*

ε) Branch parallel with the inferior costa of the scapula, and distributed to the teres major and minor, triceps, and axillary glands.

Observation. All these arteries are subject to great variety, and often produce several branches, which I forbear to enumerate, in order to make the description concise.

ξ) *Circumflexa scapularis* is the continuation of the trunk, which having sent off the above-mentioned branches, turns over the inferior costa of the scapula near the neck, and is distributed under the teres minor, and infraspinatus, as far as the spine.

†) Branches to the teretes, and extensor longus:

††) Branches extending to the base of the scapula, and communicating with the neighbouring arteries:

†††) *Ascending branch* passing between the neck and spine of the scapula, to communicate with the superspinalis: it sends off

a) Branches to the infraspinatus, capsule of the joint, and spine of the scapula:

b) Branch to the supraspinatus, which also communicates with the superspinalis:

c) Branch to the deltoid.

VIII) *Circumflexa posterior* arises between the subscapularis and teres major, and, passing between those muscles, and under the extensor magnus and deltoid, it encircles the head of the humerus. It sometimes produces the *circumflexa interior* and the *profunda humeri.*

a) Branches to the capsule of the joint:

b) Branch to the coracobrachialis, triceps, and teres minor:

c) Branches to the os humeri and bicipital groove:

d) Branches to the subscapularis, triceps, and dorsum of the scapula:

e) Branch to the capsule, triceps, and periosteum: it communicates with the branches of the *subscapularis*, and runs under the deltoid in a circular manner.

IX) *Circumflexa anterior:* this smaller artery, which arises near the former, passes under the biceps and coracobrachialis, round the

head of the humerus, and terminates in the inner surface of the deltoid.

a) Branches to the subscapularis, latissimus dorsi, and triceps: these are often wanting:

b) Branches to the bone and periosteum, communicating with the profunda humeri:

c) Branches to the biceps, capsule of the joint, coracobrachialis, and deltoid:

d) Branch entering the bicipital groove, and communicating above with the *circumflexa posterior*, below with the *profunda humeri*:

e) Branch to the deltoid.

The artery assuming the name of HUMERARIA, or *Brachialis*, passes from the axilla to the inside of the arm. The trunk arriving at the lower margin of the tendon of the teres major, continues its course along the inside of the biceps, and over the brachialis internus, and about the middle of the arm it gradually bends towards the front. Lastly, being covered by the aponeurosis of the biceps, it divides into the *cubitalis* and *radialis*, near the very bending of the fore-arm.

I) Branch to the bicipital groove, descending under the coracobrachialis, and distributed to the head of the humerus, and to the capsule of the joint.

II) Branches to the long and inner heads of the triceps and coracobrachialis.

III) Several branches to the biceps, brachialis internus, and bone.

IV) *Profunda humeri*, or *collateralis magna*, is given off from the inside of the trunk, near the lower edge of the teres major: sometimes it arises higher up from the *scapularis inferior*, or *circumflexa posterior*; sometimes, also, there are two profundæ. It bends backwards in the direction of the long head of the triceps, and, passing between that and the outer head, divides into two branches, where the outer head and brachialis internus meet together. It is distributed in the following manner:

a) Branch to the triceps:

b) Two branches to the biceps, coracobrachialis, brachialis internus, and deltoid, communicating with the *circumflexa anterior*.

c) Several muscular branches given off in the descent of the trunk, and communicating with the scapular arteries, and with branches of the *humeraria*.

d) *Radialis major communicans*, is the external branch of the divided trunks, which passing towards the outer condyle, communicates with the *radialis recurrens*, *profunda minor*, and *perforans superior interossea*. Besides its communicating branches, it sends off

α) Branches to the neighbouring muscles.

β) Nutritious branches to the bone.

e) *Cubitalis major communicans*, is a more deep-seated branch, which passes towards the internal condyle, and sends

†) Branches to the triceps and coracobrachialis, communicating with some branch of the *humeraria*:

††) Branch going out between the triceps and os humeri, to the deltoid, brachialis internus, and skin:

†††) Deep-seated branches to the neighbouring muscles, communicating under them with the *arcus posterior* of the humerus, and with the *recurrens cubitalis.*

V) Branch to the coracobrachialis, and brachialis internus:

VI) Branch communicating with the *recurrens cubitalis*, on the inner head of the triceps:

VII) Branch descending on the inner side of the arm, as far as the olecranon, and communicating with the *recurrens cubitalis* and *arcus dorsalis.*

Observation. These two branches are generally called *collaterales minores.*

VIII) Branches to the biceps and coracobrachialis, varying in number and situation.

IX) *Nutritia magna humeri*, which arises at the lower part of the coracobrachialis, bends outwards, and sends off

a) Branch to the outer head of the triceps and skin, communicating with the other arteries, which supply that muscle;

b) Deep-seated branch to the brachialis internus;

c) Branches entering the bone in two or three places;

d) Branches sometimes communicating with the *ramus anastomoticus magnus*, or *profunda minor.*

X) *Profunda minor* passes on the brachialis internus to the external condyle, communicating above with the *nutritia magna*, below with the radialis recurrens.

XI) *Ramus anastomoticus magnus* is given off from the inner side of the trunk, within a short space of the joint; then it passes to the internal condyle, perforates the intermuscular membrane, and distributes its branches both upwards and downwards into the cavity between the internal condyle and the olecranon. It produces

a) An *ascending branch* communicating with the *profunda*:

b) *Descending superficial branch* to the pronator teres, flexor sublimis, and brachialis internus: on the surface of the latter muscle it communicates with the superficial branches of the *recurrens cubitalis*; then it perforates the muscles, and communicates with the *recurrens radialis*, so as to form the *arcus anterior* round the joint:

c) Cutaneous branches to the brachialis muscle and internal condyle:

d) *Deep-seated descending branch*, communicating before the condyle with the recurrens cubitalis, and behind it with the same artery, and with the *recurrens interossea*:

e) *Transverse branch*, communicating over and behind the internal condyle with the *profunda humeri*, the *profunda minor*, and all the *recurrent arteries*, so as to form the *arcus humeri dorsalis*, which distributes its branches to the joint and surrounding parts.

XII) Branches of less consequence to the brachialis internus, and the muscles which are connected to the inner condyle.

Cubitalis Arteria. The *art. humeraria* occasionally divides into its two branches in the middle of the arm, or even higher up: usually,

however, the division takes place at the bend of the fore-arm, and this is the larger artery of the two. It plunges deeply into the cavity formed in front of the brachialis internus, and filled up by the tendon of the biceps, the median nerve, fat, and other vessels : it gets to the ulnar side of the fore-arm, under the pronator teres, the flexor carpi radialis, the flexor digit. sublimis and palmaris longus; then taking its situation between the flexor sublimis, the profundus, and the flexor ulnaris, it arrives at the carpus; passing over this, it forms the *arcus superficialis* of the hand, which communicates with the *art. radialis*, and distributes its branches to the fingers. Its most remarkable branches are the following:

I) Branches to the pronator teres, and origin of the flexor muscles:

II) *Interossea perforans posterior suprema*, sends a branch to the brachialis internus, which contributes to form the *arcus anterior;* then it penetrates between the bones, and sends many branches to the *arcus dorsalis*, and downwards to the anterior muscles. Sometimes this is produced by the *interossea communis.*

III) *Recurrens cubitalis*, arises from the ulnar side of the trunk, a little above the *interossea communis;* it is reflected to the back of

the inner condyle, through the flexor muscles: in its course it produces,

a) Branch to the capsule, flexor muscles, and ulna:

b) *Superficial branch*, ascending under the pronator teres to the front of the inner condyle, and communicating on the surface of the brachialis internus with the *r:us anast. humerariæ*.

c) *Deep-seated branch*, passing between the flexor sublimis and profundus, to the cavity formed between the olecranon and inner condyle: it sends off,

†) Branch to the flexor sublimis and profundus:

††) Branch to the flexor and extensor ulnaris and periosteum:

†††) Branch communicating in the above-mentioned cavity with the *profunda humeri* and *r:us anast.* and with branches of the *interossea*:

†††† Several branches to the joint.

IV) The nutritious artery of the ulna, which enters the front of the bone near the origin of the flexor profundus.

V) *Interossea communis.* This artery is given off at the superior origin of the flexor profundus, descends along the interosseous ligament between the flexor pollicis and flexor digitorum profundus, as far as the pronator quadratus, and there divides into the two branches marked *i* and *k*.

a) Branches to the flexor radialis, profundus and sublimis, and pronator teres:

b) Branch to the supinator brevis, and capsule of the joint.

c) Branch to the flexor pollicis, and tendon of the biceps.

d) A nutritious artery which enters the middle of the ulna.

e) *Interossea perf. suprema posterior*, which sometimes arises entirely from the *cubitalis*, as was mentioned before; but sometimes there are two of these arteries, the

larger of which sends a branch under the extensor digiti minimi to the carpus, where it inosculates with the trunk of the *interossea post. dorsalis*: it gives off,

α) Reflected branches to the supinat. brevis and extensor communis:

β) Branches to all the extensor muscles.

f) Large branch to the flexor profundus; and several branches to that and the flexor pollicis:

g) A nutritious artery to the radius:

h) *Interosseæ perforantes*, in number from four to seven, perforating the interosseous ligament separately, and distributed to the extensor muscles.

i) *Interossea post. dorsalis* is the larger branch of the divided artery, coming off at the lower edge of the pronator quadratus, and going to the back of the wrist: here it divides into three arteries, and gives off

α) Branch to the pronator quadratus.

β) Branches to the tendons of the radial extensors and the periosteum, communicating with the lower branches of the *art. radialis*.

γ) Branch communicating with the *interossea perf. suprema post.*

δ) *Ulnar branch*, passing along the back of the ulna, and communicating with the *art. radialis*, with the following *middle branch*, and with the *dorsalis manus*.

ε) *Middle branch*.

ζ) *Radial branch*: these two arteries pass under the tendons and ligaments of the carpus, and form a beautiful network by their communications with the *ulnar branch*, the *perforating arteries* of the *radialis*, the *dorsalis carpi*, and *dorsalis manus*.

k) *Interossea volaris anterior* passes under the pronator quadratus to the ligaments of the carpus, where it communicates with the *arcus volaris profundus*.

VI) Several branches of uncertain number and situation to the flexors of the wrist and fin-

gers, the palmaris, the median nerve, and skin.

VII) *Dorsalis manus* arises about an inch from the os pisiforme, turns round the head of the ulna, and goes to the back of the little finger :

a) Branch to the pronator quadratus, communicating with a branch of the *radialis* ;

b) Branch communicating with the *art. interossea dorsalis* ;

c) Branches to the wrist and back of the carpus, communicating with the branches of the *dorsalis carpea* ;

d) *Dorsalis digiti minimi*, which terminates on the first phalanx, by communicating with the other arteries of the little finger.

VIII) Branches to the os pisiforme, and internal ligament of the carpus, to the flexor tendons, and palmaris brevis.

IX) Branches to the abductor, flexor brevis, and adductor digiti minimi.

X) *Cubitalis manus profunda* arises at the lower border of the ligamentum carpi, dips down between the abductor and flexor brevis minimi digiti, and immediately joins the *arcus profundus* ; it gives off branches to the adjacent muscles and skin.

XI) *Volaris cubitalis digiti minimi*, which gives branches to the muscles of the little finger, and, passing towards the outside of that finger, communicates with the *dorsalis digiti minimi.*

XII) *Digitalis volaris prima.*

XIII) *Digitalis volaris secunda.*

XIV) *Digitalis volaris tertia.* These three arteries are given off from the trunk, as it turns transversely over the flexor tendons, to form the *arcus superficialis;* arriving at the roots of the fingers, they divide into two branches, of which one goes along the side of one finger, while the other goes up the opposite side of the next finger. Each of these arteries passes along the side of its finger to the very apex, where the arteries of each side communicate. They send off,

a) Branches to the lumbricales and flexor tendons:

b) Branches communicating with the deep-seated arch:

c) Cutaneous branches to the back of the finger:

d) Branch reflected along the root of the nail.

XV) Branches to the muscles of the thumb, flexor tendons, and skin.

XVI) *Communicating branch,* which joins with a branch of the radialis, near the upper border of the adductor pollicis. From this union is produced a trunk, which sends off an artery to the outside of the fore-finger, and inside of the thumb.

XVII) Minute branches from the concave side of the arch, which are distributed over the flexor tendons and the carpus.

Radialis. This smaller branch of the *Humeraria* passes along the surface of the pronator teres, till it gets in the course of the radius, where it is situated on the flexor pollicis longus,

and between the supinator longus and flexor radialis. At the lower end of the radius it passes under the extensor tendons of the thumb, to the back of the hand; then it dips between the metacarpal bones of the thumb and fore-finger, penetrating the lower part of the abductor indicis, and of the adductor pollicis, to arrive in the palm of the hand, where it is reflected under the flexor tendons, so as to form *the arcus profundus volæ,* in which it terminates.

I) Branch to the supinator longus, and extensores radiales:

II) *Recurrens radialis*, which is reflected round the tendon of the biceps, to the external condyle, being hidden by the supinator longus, extensor rad. brevior, and brachialis internus. It gives off,

a) Branches to the pronator teres, and to all the extensors;

b) *Superficial communicating branch*, which anastomoses on the surface of the brachialis internus, with the *profunda humeri* and *profunda minor*:

c) A branch which enters the substance of the brachialis internus, and communicates with the *r:us anast. magnus humerariæ*, on the periosteum, and capsule of the joint, so as to contribute to the *arcus anterior;*

d) Branches to the ligaments of the elbow-joint;

e) *Deep anastomosing branch*, which gets to the back of the external condyle under the muscles, and communicates with some branch of the *profunda minor*, or *profunda humeri*.

III) Several branches given off to the muscles on

each side of the artery, *viz.* the flexor profundus and sublimis, flexor pollicis, flexor radialis, pronator teres, extensores radiales, and supinator longus & brevis; these anastomose with branches of the *ulnaris* and *interossea communis*:

IV) Branch to the pronator quadratus:

V) Branches to the flexor tendons, to that of the supinator, and abductor pollicis.

VI) *Superficialis volæ,* arises just as the trunk begins to turn towards the back of the hand; it passes over the abductor, or opponens pollicis, being quite superficially seated. This artery is subject to great variety: sometimes it is so small as not to go further than the abductor; when it is larger, it gives off

α) Several branches to the ligaments of the carpus, and to the abductor and opponens pollicis.

β) Branch communicating with the *dorsalis radialis pollicis*:

γ) Branch communicating with the *cubitalis,* near the end of the flexor pollicis. It is sometimes wanting.

δ) *Artery to the inside of the thumb:* this sometimes arises from the trunk itself, as will be seen hereafter. Sometimes, however, the *superficialis volæ* is continued over the adductor to the ulnar side of the thumb.

VII) Branch to the flexor tendons, ligament of the wrist, and radius itself; also to the tendons of the extensores radiales:

VIII) Branch to the neighbouring joints and bones:

IX) Branch to the abductor brevis and opponens:

X) *Dorsalis pollicis radialis* is given off after the artery has passed to the back of the hand, and it follows the outer or radial side of the back part of the thumb.

a) Branches to the extensor tendons of the thumb, to the abductor and opponens, forming a communication with the *princeps pollicis* at the first joint of the thumb.

XI) *Dorsalis pollicis ulnaris* follows the ulnar side of the back of the thumb, and communicates with the *dorsalis radialis,* and *artery of the inside of the thumb.*

XII) *Dorsalis carpea* is given off near the tendons of the extensores radiales, and passes across the wrist, under the extensor tendons, to communicate with the *interossea,* and to form the *arcus carpi dorsalis* with the *dorsalis manus :*

a) *Interossea dorsalis prima.*

b) *Interossea dorsalis secunda.*

c) *Interossea dorsalis tertia :* these three arteries pass between the metacarpal bones, on the interosseous muscles, and terminate in the bifurcation of the *digitales volares.*

†) Branches which communicate with the perforating arteries of the *arcus profundus :*

††) Branches to the interossei muscles, bones and joints of the carpus, and extensor tendons.

XIII) *Dorsalis indicis,* which arises just as the trunk begins to turn into the palm of the hand, and passes to the back of the forefinger, where it communicates with the other arteries of that finger :

XIV) *Princeps pollicis.* This artery is given off after the trunk has dipped under the muscles ;

it then passes towards the thumb, between the abductor and adductor, and gives off

a) Branches to the neighbouring muscles:

b) Branches to the hollow of the carpus:

c) Branches communicating with the other arteries of the thumb:

d) *Artery to the radial side of the fore-finger:* this passes over the adductor pollicis, and along the side of the finger: it communicates with the *dorsalis indicis*:

e) *Artery to the radial side of the thumb*, communicating at its apex with the following artery:

f) *Artery to the ulnar side of the thumb*, which is often produced by the *superficialis volæ* of the *radialis*; it receives the communicating branch of the *arcus superficialis*.

XV) *Perforantes superiores*, three in number, produced by the concave side of the arch, and passing to the back of the hand, at the upper extremity of the metacarpal bones. They communicate with the *dorsalis carpea.*

XVI) *Six or seven perforantes inferiores*, produced by the convexity of the *arcus profundus*, penetrating the interstices of the metacarpal bones, and communicating with the *interosseæ dorsales* and *digitales volares.*

XVII) Retrograde branches to the carpus, communicating with branches of the *cubitalis.*

XVIII) Branch joining the *cubitalis profunda*, and thereby completing the arcus profundus.

SECTION II.

The Branches of the Descending Aorta.

It was observed, in the general view of the AORTA, that, after having formed its transverse arch, it passed gradually behind the lungs, to the left side of the bodies of the vertebræ; that, being supported by the vertebræ, and situated behind the pleura, it descended in a straight course to the fleshy columns of the diaphragm; and that, having arrived in the abdomen, it descended to the lower lumbar vertebræ. This course of the DESCENDING AORTA affords a convenient opportunity of dividing it into two parts; *viz.* the *aorta thoracica* and *abdominalis.* The columns of the diaphragm, which separate, to allow of the passage of the aorta, mark its division into two parts.

DISTRIBUTION of the AORTA THORACICA.

The THORACIC AORTA is found on the left side of the vertebræ, throughout its whole course; at the lower part, however, it seems to

incline towards the middle. It gives origin to many branches worthy of notice, although none of them are large.

I) *Pericardiaca posterior superior*, arises from the concave part of the arch; yet it frequently comes off from the *subclavia*, or *mammaria interna*. See the *mam. int.* where its course is described.

II) *Bronchialis communis*, arises from the front of the aorta, and soon divides into the *bronchialis dextra & sinistra*. Each of these arteries passes to the front of the bronchia, supplying that part, the bronchial glands, and pulmonary vessels. The left artery extends to the posterior surface of the lungs; the right to the œsophagus. Sometimes it is entirely wanting; sometimes it is large enough to supply the place of the three following:

III) *Bronchialis dextra*, arising from the *aorta*, or from the *intercostalium inferiorum superior*: it distributes its branches to the bronchial vessels and glands; also to the pleura, back of the pericardium, and left auricle:

IV) *Bronchialis sinistra*, or *superior*, has a similar distribution with the latter, to the left lung.

V) *Bronchialis inferior* is given off about the fifth dorsal vert. and follows the course of the air vessels to the interior of the lungs.

Observation. The bronchial arteries are very remarkable, on account of their communications with the minute branches of the

pulmonary artery; but, like other small vessels, they are subject to great variety.

VI) *Œsophageæ*, five or six in number: these arteries are very small; they play on the surface of the œsophagus, and are also distributed in the posterior mediastinum and pericardium. They communicate with the *coronaria superior* of the stomach, and with the *phrenica*.

VII) *Intercostales inferiores*, or *aorticæ*, from eight to ten in number; they arise from the posterior and lateral part of the trunk, and take the course of the lower or grooved edge of the rib. The arteries of the right side pass over the bodies of the vertebræ, and are therefore longer. The upper ones are smaller, and ascend a little: the course of the lower ones is transverse. The upper one arises about the fourth dorsal vert. and communicates with the *intercostalis superior* of the *subclavia*. They all give off,

a) Three branches to the spinal canal: the first supplies the bone; the second, the dura mater; and the third, the medulla itself:

b) Branches penetrating to the muscles of the back:

Observation. These branches are sometimes produced by a common trunk.

c) Several branches to the intercostal muscles, and through them to the serratus ant. pectoralis, latissimus, and obliquus externus:

d) *Upper branch*, given off at the angle, and following the upper edge of the rib:

ε) *Lower branch*, may be considered as the continuation of the trunk: it communicates above with the *thoracicæ* and *mammaria int.*; below, and on the surface of the abdomen, with the *epigastricæ* and lumbales.

DISTRIBUTION of the AORTA ABDOMINALIS.

The ABDOMINAL AORTA is the lower part of the trunk, which passes out of the thorax, between the crura of the diaphragm. It holds a straight course along the bodies of the vertebræ, to the fifth lumbar vert. or to the ligament which connects the fourth and fifth. The crura of the diaphragm are so separated for the passage of the aorta, that it lies back on the bone: the space which they leave is more than sufficient for the passage of the artery, and it is filled up by loose cellular substance, which connects the peritonæum and pleura. At this part the aorta is separated from the vena cava by the left lobe of the liver, and by the substance of the diaphragm; but between the kidney and liver these vessels approach so near to each other, that the right side of the artery is covered by the vein. At the above-mentioned part, the *aorta abdominalis* divides into the two ILIACÆ COMMUNES, which are of equal size, and, forming

an acute angle with each other, pass on to the brim of the pelvis.

I) *Phrenica dextra & sinistra*, vary much, both in respect to their origin and distribution. A single trunk, arising from the *aorta*, above the *cœliaca*, sometimes produces both; sometimes the right artery comes from the *cœliaca*, the left from the *aorta*, or both of them may arise from either of these arteries. Sometimes a common trunk producing both *phrenicæ*, arises from the *cœliaca*, and then it gives off the superior branch of the *coronaria ventriculi*. There may be three or four *phrenicæ*. They pass before the crura to the lower margin of the greater diaphragm, and give off various branches in every direction. They then bend forwards along the edge of the central tendon, and communicate with each other, and with the thoracic vessels.

1) Branches to the renal capsules and fat. [See the description of these arteries, at page 67.]

2) Branches on the right side to the pancreas, liver, vena cava, and pericardium; on the left side to the liver, ligament of the spleen, œsophagus, and cardia.

Observation. The diaphragm receives various branches from the *cœliaca*, *capsulares*, *intercostales*, and *lumbales*.

II) *Cœliaca* arises from the aorta, while it still lies between the crura of the diaphragm, about the eleventh dorsal vertebra. It is situated at the upper part of the pancreas, between the lobulus spigelii and the left part

of the lesser arch of the stomach. There, after a course of about four lines, it divides into three branches; dividing, however, first, towards the right, then sending off its left branch.

1) *Coronaria superior*, or *gastrica major sinistra*, or *superior*; or *gastro hepatica sinistra*. This is the smallest of the three branches, if it is only distributed to the stomach; but it almost equals the *splenic*, when it sends a branch to the liver, which frequently happens. Sometimes it seems to arise from the *splenic*. It turns upwards and forwards towards the left, arrives at the cardia and lesser arch of the stomach, and then descends towards the right, along the arch of the stomach, distributing its branches over both the surfaces of the stomach.

a) *Superior branch* to the great extremity of the stomach.

α) Branch anastomosing with the *æsophageæ*:

β) Branches to the diaphragm, omentum minus, and renal capsule.

γ) Transverse branch, communicating with the vasa brevia.

b) *Inferior branch*; this passes along the lesser arch to the pylorus, and sends off,

α) Numerous branches to both the surfaces of the stomach, communicating with the *gastro epiploicæ*;

β) *Pylorica superior* may be considered as the continuation of the trunk, distributed partly to the stomach, partly to the pylorus; it terminates by a communication with the *pylorica dext. super.* of the *hepatica*.

c) When there is an *hepatic branch*, the *coronaria*, having given off the above-mentioned arteries, turn upwards between the lesser arch of the stomach and the left lobe of the liver, to be distributed to that lobe, to the lobulus spigelii and fossa umbilicalis. At other times these branches are produced by the *hepatic branch* of the *cæliaca*.

2) *Hepatica*, which is less than the *splenica* in adults,

larger in young subjects. It arises from the right side of the *cæliaca*, or sometimes of the *mesenterica superior*, near the lobus spigelii, where it is covered by the pancreas. Situated behind the lesser extremity of the stomach and the duodenum, it ascends towards the right, and after a course of about two inches, it divides beneath the neck of the gall-bladder, into the *hepatica dextra* and *sinistra*, which enter the liver at the transverse fissure. The artery is continued with the other hepatic vessels, in Glisson's capsule, where it is found between the vasa biliaria and the vena porta. Before its division it gives off,

a) Small pancreatic branches, and small branches to the little omentum :

b) *Duodeno-gastrica* or *gastro-duodenalis* or *pancreatico-duodenalis :* this artery passes behind the duodenum, between the origin of the duodenum and the head of the pancreas. Then it takes the course of the greater arch of the stomach, being received between the laminæ of the omentum, and communicates with the *gastro epiploica sinistra* at about the middle of the greater arch.

α) Small pancreatic branches.

β) *Pylorica inferior* passes under the duodenum to the lower part of the pylorus, and communicates with the *pyloricæ superiores :*

γ) Small duodenal branches, which are frequently wanting :

δ) *Duodena superior dextra*, which sometimes arises distinctly from the *hepatica ;* sometimes there are two or three of these arteries. It passes along the back part of the two first turns of the duodenum, and communicates on the intestine with the *duodenalis inferior* of the *mesenterica*. Sometimes it is distributed on the back of the duodenum, as the *pancreatico-duodenalis* is on the front : it communicates with the *pyloric arteries*.

ε) *Pancreatico-duodenalis* takes a semicircular course along the inside of the duodenum, distributing its branches to that intestine, and to the pancreas, and communicating with the *duodenales* of the *mesenterica*.

ζ) *Pancreatica transversa*, arises near the lower margin of the firſt turn of the duodenum, and passes along about two-thirds of the back surface of the pancreas. It sometimes arises from the *mesenterica* or *splenica.*

η) *Gastro-epiploica dextra*, or *gastrica dextra*, or *coronaria inferior*, is the continuation of the trunk along the greater curvature of the stomach, about the middle of which it terminates by communicating with the *gastro-epiploica sinistra:* it sends off,

a) *Epiploica posterior major*, which goes to the right part of the great omentum, and extends to the colon:

b) *Epiploicæ minores*, which have a similar distribution to the rest of the omentum.

c) Branches to both surfaces of the stomach, communicating with the other arteries of the stomach.

c) *Pylorica sup. hepaticæ*, or *gastrica dextra minor*, or *coronaria minor*, is reflected at an acute angle to the lesser arch of the stomach, where it communicates with the *pyloric* branch of the *coron. super.* It previously sends off branches to the pylorus.

Hepatica sinistra is the smallest branch of the divided trunk, and is entirely wanting, when the *coronaria super. ventric.* produces an *hepatic* branch. It enters the liver at the fossa umbilicalis, and produces,

α) Branches to the left lobe of the liver and lobulus spigelii;

β) Branches to the suspensory and round ligaments, communicating with the *epigastric*, *phrenic*, and *internal mammary* arteries.

Hepatica dextra, or *biliaria*, passes under the gall-ducts to the fissura transversalis. It sometimes arises from the *mesenterica sup.* and sometimes there are two of these arteries.

†) *Cystica* passes along the left side of the gall-bladder, and ductus cysticus, to the fundus of the gall-bladder, and terminates in the substance of the liver: it gives off,

*) Branches to the biliary ducts:

**) Numerous branches between the coats of the gall-bladder.

††) Large branches to the left lobe of the liver.

3) *Splenica.* This artery passes along the back of the pancreas, making many large turns, both upwards and downwards. Before it enters the notch of the spleen, it divides into several branches, the course of which is also tortuous. Some of its twigs penetrate the substance of the spleen, and terminate on the diaphragm and stomach.

a) Pancreatica magna, is an artery of uncertain size and origin; sometimes it is entirely covered by the pancreas. Sometimes it gives branches to that alone; sometimes to the duodenum and mesocolon also. Sometimes it sends a branch to supply the place of the *pancreat. transv.*: it communicates with the *pyloricæ* and *duodenales.*

b) Pancreaticæ parvæ: these are numerous, and are sent off throughout the whole course of the *splenic*:

c) Gastricæ posteriores, two or four in number, and sometimes wanting: they are given off from the middle of the trunk, and go to the posterior part of the great extremity of the stomach:

d) Gastro-epiploica sinistra, or *gastrica sinistra,* is reflected, near the end of the pancreas, and after the divifion of the artery, to the great curvature of the stomach, where it communicates with the right artery of the same name: it sends off,

α) *Pancreatic branches:*

β) *Epiploic branches:*

γ) Arteries to the stomach, communicating with the *coron. super.*

e) Vasa brevia are three or four branches, reflected, after the division of the artery, to the fundus of the stomach.

Observation. The *splenica* sometimes sends a branch to the transverse arch of the colon, communicating with the *colica media.*

III) *Mesenterica superior.* This, which is the largest branch of the abdominal aorta, arises

from the front of the trunk, about three or four lines below the *cœliaca*. Here it is situated between the lower margin of the pancreas, and the last curvature of the duodenum, over which it passes, and bends a a little to the right, under the mesocolon. Then being received between the laminæ of the mesentery, it turns first to the left, and then again to the right, by which means it arrives at the right groin; its last, or great curvature, being concave towards the right side. Having sent off some small branches, two arteries go from the right side of the trunk to the large intestines; the left side produces very numerous branches for the supply of the small intestines.

1) *Pancreaticæ posteriores*, communicating with the other arteries of the gland.

2) *Duodenales inferiores sinistræ* are two or three in number, proceeding to the lower curvature and left side of the duodenum, and communicating with the *duoden. super*. and *pancreatico duodenalis*. They vary much.

3) *Colica media*, or *colica superior*, passing along the mesocolon, to the ascending and transverse arch of the colon. It divides, after a short course, into two branches, which sometimes arise separately: these are,

a) *Colica transversa*, bending towards the transverse arch of the colon, and dividing sooner or later into two branches:

†) *Right branch*, which forms an arch with the *ascending branch* of the *colica dextra*; from the convexity of this arch, as from other similar ones, numerous parallel branches pass to the intestines, and divide, in order to surround them. The minute branches communicate freely with the *epiploicæ*.

††) *Left branch*, passing to the left side of the arch of the colon, and forming the celebrated mesenteric arch, with a communicating branch of the *colica sinistra*. The branches of this arch go to the intestines, like those of the former.

b) *Colica dextra superior*, passes transversely to the hepatic flexure of the colon, and gives off,

†) An *ascending branch*, which forms an arch with the *right branch* of the *colica transversa*;

††) Two or three branches to the ascending colon, sometimes forming small arches with each other;

†††) A *descending branch*, communicating with the *ascending branch* of the *ileo-colica*, and thereby forming a large arch.

4) *Ileo-colica* arises also from the right side of the trunk, one or two inches below the last artery. It passes over the psoas to the conjunction of the cæcum and ileum: it sends off,

a) An *ascending branch*, which communicates with the *colica dextra superior*;

b) *Colicæ dextræ inferiores*, proceeding to the intestine;

c) *Cæcalis* is the continuation of the trunk, which directs its course to the cæcum, and gives off,

α) An artery to the front of the cæcum:

β) An artery to the back of the cæcum:

γ) An artery to the appendix vermiformis:

δ) A branch which communicates with the termination of the mesenteric trunk.

The number of branches produced from the left, or convex side of the *superior mesenteric*, varies from twelve to twenty. The middle branches are the longest and largest, the upper and lower ones gradually becoming shorter and smaller, and the last communicating with the *ileo-colica*. They proceed in a parallel manner in the folds of the mesentery, and soon divide into two branches, each of which forms an arch with the neighbouring branch; from

the convexity of these arches are given off other branches, which divide and re-communicate in a similar manner. This is repeated a third, and where the branches are longest, a fourth and fifth time, till the last branches go straight to the intestines, divide, and surround them: they form most beautiful net-works in the cellular substance of the intestines, and so cover the internal membrane as to give it the appearance of being composed entirely of vessels. The lymphatic glands, and the coats of the blood-vessels, receive numerous small twigs.

Observation. The minute branches of this artery communicate near the duodenum and the commencement of the small intestines, with the *spermaticæ*, *capsulares* and *adiposæ*. In the fœtus, also, there is a remarkable connexion between the *mesenterica* and the *epigastrica*.

IV) *Mesenterica inferior*, or *colica sinistra*; arising from the left side of the aorta, below the *renal* and *spermatic* arteries: it descends on the left side of the vertebræ, till it arrives at the division of the aorta into the *iliacæ*; there it sends off a large branch, and then dips into the pelvis behind the rectum, descending along its posterior surface, as far as the sphincter: it sends off,

α) One or two branches to the lumbar glands and peritonæum:

β) *Colica sinistra*; which is a large and short trunk, soon dividing into three branches: these are,

a) *Ascending branch*, forming, by its communication with the *colica transversa*, the great mesenteric arch;

b) *Transverse branch*, proceeding to the descending colon, and communicating above with a branch of the former; below, with a branch of the following artery:

ε) *Descending branch*, supplying the iliac flexure, and the lower part of the descending colon. Sometimes it divides into three branches, which communicate with each other, and with the preceding artery.

Observation. The *colica sinistra* sends off branches which communicate with the *lumbar* and *spermatic arteries.*

γ) *Hæmorrhoidalis interna* is the name applied to the continuation of the trunk along the posterior surface of the rectum: it sends off,

1) Branches which immediately surround the rectum, and communicate on the front of that intestine:

2) Branches which communicate, towards the termination of the rectum, with the *hæmorrhoidalis media*, *vesicalis ima*, or *uterina hypogastricæ.*

V) *Capsulares*, or *atrabiliariæ, dextra & sinistra.* These arteries are constant in their destination to the renal capsules, to which they send a great number of branches; but they vary almost infinitely in their number, size, and course. They may be conveniently arranged in three classes:

1) *Capsulares supremæ*, in number from two to four, are produced by the *phrenic arteries*, and, besides supplying the capsules, send twigs to the renal fat.

2) *Capsulares mediæ* arise from the aorta, somewhere between the *phrenic* and *superior mesenteric* arteries: they proceed transversely to the capsule, and send off,

a) Minute *phrenic* and *adipose* arteries;

b) Branches on the right side, to the liver, vena cava, and duodenum; on the left side, to the surface of the spleen and the mesocolon. They communicate with the proper arteries of these viscera.

3) *Capsulares infimæ* arise from the upper edge of the *renal* artery, and, when they are large, distribute branches to the adjacent viscera and renal fat.

VI) *Renalis,* or *emulgens dextra & sinistra,* usually depart from the side of the aorta, between the superior and inferior mesenteric arteries, at somewhat less than a right angle. The left, which is rather the shortest, passes over the vein, near the kidney; the right is covered by its corresponding vein. As the renal artery approaches the notch of the kidney, it divides into two or four branches, which enter before and behind the pelvis, and send their branches along the columns of the papillæ. These form arches with the neighbouring branches, and thereby seem to separate the cortical and tubular part of the kidney. The convex and concave surfaces of these arches send off innumerable small arteries; the former of which ramify in the cortex of the kidney: the latter are consumed amongst the tubuli. Some small twigs penetrate the substance of the kidney, and are lost in the renal fat. The artery gives off, before it arrives at the kidney,

1) *Capsulares infimæ;*
2) Small *phrenic* arteries to the crura of the diaphragm;
3) Several *adiposæ;*
4) *Uretherica suprema;*
5) Branches communicating with the spermaticæ.

VII) *Spermatica dextra & sinistra.* This very long and slender artery arises from the side of the aorta, between the *renal* and *mesenteric* arteries, but not always from the same part on both sides. The left is frequently the highest, and often arises from the *renalis*

or *capsularis infima.* Two have been seen on each side. Arising at a very acute angle, it pursues a tortuous course, which is more remarkable in women than in men, in front of the vena cava on the right side, and gets in company with its vein on the psoas muscle. In men, it passes through the abdominal ring with the spermatic chord, and, approaching the testicle, divides into five branches; two of these branches supply the epididymis; the others, passing on to the testis itself, perforate the albuginea, and send off other serpentine branches, which are reflected at the lower part of the testis, and partly terminate in its substance, and partly in the spermatic ducts. In this course the artery gives off, without any sensible diminution of its diameter,

1) *Adiposæ mediæ & inferiores;*
2) *Uretbericæ superiores;*
3) Branches to the duodenum, vena cava, and liver, on the right side, and mesocolon on the left;
4) Branches to the lumbar glands and peritoneum;
5) Branches to the spermatic chord, cremaster, and septum scroti.

The *spermatic artery* in females does not go out at the abdominal ring, but is involved in the ligamentum latum, and divides into

†) *Posterior branches* for the convex side of the ovary.

††) *Anterior branches,* which pass along the alæ to the tubes, and thence to the posterior surface of the uterus: they communicate with each other, and with the other *uterine arteries.* One of the branches passes with the round ligament through the abdominal ring, and communicates with the *epigastrica* and *pudendæ externæ.*

VIII) *Adiposæ, dextræ & sinistræ.* These arteries vary in their number and origin, and may be divided into certain classes.

1) *Adiposæ superiores* arise from all the *capsulares*, and are distributed to the upper and outer part of the renal fat.

2) *Adiposæ mediæ* arise from the *renalis*, *spermatica*, and *aorta* itself.

3) *Adiposa ima* arises from the *spermatica*, below the lower extremity of the kidney, and communicates with the other *adiposæ*.

IX) *Urethericæ;* these small arteries arrive at the canal at different parts, whence they also may be arranged in different orders.

1) *Urethericæ superiores*, arising from the *renalis*, *capsulares infimæ*, & *spermaticæ*, supply the pelvis of the kidney, and the upper part of the ureter.

2) *Urethericæ mediæ* arise from the lower part of the *aorta*, from the *iliaca communis*, or *spermatica*.

3) *Uretherica ima* arises from the *vesicales imæ*, or *uterina*, on each side.

X) *Lumbales dextræ & sinistræ.* These are five in number, and arise from the side and back part of the aorta, at almost a right angle. Those of the right side are the longest; the upper ones have a transverse course; the lower ones descend a little. They arise between the bodies of the vertebræ, and are distributed to the parts which are parallel with their origin. All, except the first, are soon covered by the psoas muscle: they all give off the following branches:

1) *Two spinal branches*, which are sometimes produced by a single trunk, sometimes come off separately. They

enter at the foramen, formed for the passage of the nerves, when the larger branch is distributed to the coverings of the spinal marrow, the smaller one to the marrow itself.

2) *Muscular branches*, which soon divide again into

†) *Anterior branches*, which supply the psoas, *quadratus*, and abdominal muscles, and communicate with the *intercostales* and *epigastricæ*;

††) *Posterior branches*, which pass backwards to the muscles of the loins, and are distributed to them and to the vertebræ.

The *lumbalis prima* passes behind the crura of the diaphragm and the psoas, and bends towards the front between the transversus and obliquus internus. It gives off a phrenic branch.

The *lumbalis quarta* sends a branch round the crista of the ileum, which terminates on the transversalis and iliacus internus, communicating with the *ileo-lumbalis*. The *lumbalis quinta* is shorter than the rest, and sometimes arises from the *iliaca communis*, or *ileo-lumbalis*; its anterior branches only supply the iliacus internus.

DISTRIBUTION of the ILIACA COMMUNIS, and of its BRANCHES.

The ILIACA COMMUNIS passes over the lower part of the vena cava, on the right side; on the left side, it lies exterior to its vein, but does not cover it. After a short course, it divides into two branches, one of which descends into the pelvis, and takes the name of *iliaca interna*, or *hypogastrica*; the other passes on to the thigh,

and is called *iliaca externa,* and afterwards *femoralis.* The *sacra media* is generally its only branch, except sometimes a few minute twigs to the ureter.

Sacra media is about equal in size to a lumbar artery; it arises from the very point of bifurcation of the aorta, or else a little higher up, or from some lumbar artery, or from one of the iliacæ communes. It descends along the middle of the front of the sacrum, as far as the coccyx, where it terminates by forming an arch with the *sacræ laterales.*

a Transverse branches, communicating with the *sacræ laterales.*

b) Branch to the rectum, which is sometimes so large as to supply the place of the *hæmorrhoidales.*

c) Branches to the neighbouring muscles from the convexity of the arch.

I. *Iliaca interna,* or *hypogastrica,* is five times larger than the *external iliac* in the fœtus, but in the space of a year it becomes of about the same size. As it is continued into the *umbilical artery* in the fœtus, and as that artery takes off almost the whole of its blood, it forms an arch, convex downwards; and the smaller arteries of the pelvis are sent off from its inferior or convex part. It passes over the brim of the pelvis between the ilium and sacrum,

and descends between the sides of the pelvis and the contained viscera. It divides in such a manner that none of its branches seem to follow the direction of the trunk; but as the *pudenda communis* and *ischiadica* take the straightest course, anatomists affirm that the trunk terminates in them. Its branches are constant in their destination, but vary much in their origin; some of them supply the viscera of the pelvis, others are distributed to the external parts.

I) *Ileo lumbalis*, or *iliaca parva*, is the first branch of the trunk, or else it arises after the *sacræ laterales*; it ascends between the psoas magnus and iliacus internus, towards the crista of the ilium; and gives off,

a) Branches to the psoas;

b) Branch ascending between the last lumbar vertebra and ilium, and supplying the iliacus internus, and transversalis, the os ilium and sacrum, communicating with the *lumbalis quinta* and *sacræ laterales*.

c) Transverse branch passing under the psoas to the concavity of the ilium, and supplying the iliacus internus, transversalis and bone, and communicating with the *abdominalis* of the *femoral artery*.

II) *Sacræ laterales* vary in their number and origin. Sometimes the trunk itself, or the *iliaca posterior*, or the *ileo-lumbalis*, gives off a single artery, which descends on the sacrum near the foramina of that bone to the coccyx, and there forms the arch with the *sacra media*. Sometimes there are even four or five *sacræ*

laterales; in which case they communicate with each other, and the lowest communicates with the *sacra media*. They give off,

a) *Anterior branches*, which communicate with the *sacra media* on the sacrum:

b) *Spinal branches*, which enter the sacral holes, and supply the cauda equina and its membranes; they send out branches through the posterior sacral hole, to supply the surrounding parts.

III) *Umbilicalis*, which was the true trunk of the *hypogastric* in the fœtus, degenerates in the adult into a soft ligament; still, however, the commencement of the artery is pervious. It descends to the lower part of the bladder, and, being connected to its sides, ascends again, converges towards its fellow of the opposite side, and is inserted, with the urachus, into the umbilicus. The pervious portion of the artery sends off, in *men*,

a) Two or three *vesical arteries* to the upper, middle, and lower part of the bladder:

b) Branches to the ureters and vas deferens, communicating with the *pudendæ*:

c) *Hæmorrhoideal branches* to the sides of the rectum.

In *women* it produces,

a) Branches to the sides of the bladder, uterus, and vagina:

b) Small branches to the rectum.

IV) *Vesicales imæ* vary in size and number according to the magnitude of the other vesical arteries. There is always at least one arising near the *umbilicalis*, and passing along the lower part of the bladder to the urethra, and

giving branches to the rectum and vagina in females. The artery is larger in men; and if there are two of these arteries, one or both proceed from the *hæmorrhoidea media.* Haller has seen these arteries given off from the *pudenda, ischiadica,* and *obturatoria.* It gives off,

a) Branch to the vesiculæ seminales, vas deferens, and prostate; communicating, between the bladder and rectum, with the *profunda penis.*

b) Branch to the bulb of the urethra.

V) *Hæmorrhoidea media* is a large artery arising between the *pudenda* and *iliaca posterior,* or from the *pudenda* itself: sometimes it is entirely wanting: it runs along the front of the rectum, as far as the sphincter. In *men* it gives off,

a) Branches surrounding the intestines, and communicating with the *hæmorrhoidales mesentericae;*

b) Branches to the sphincter, levator and skin, communicating with the *hæmorrhoidalis externa;*

c) Branches to the lower part of the bladder, the *vesiculae seminales,* and prostate.

In *women* it gives off large branches to the vagina, where they sometimes form a particular vaginal artery.

VI) *Uterina;* this artery, which is peculiar to women, arises near the *hæmorrhoidea, pudenda,* or *umbilicalis.* It passes along the side of the uterus, and is, lastly, reflected to the posterior surface; it gives off,

a) A *vesical artery* to the bottom of the bladder:

b) A *descending branch,* ramifying on the vagina, and sending off some small vesical arteries:

c) *Ascending branch*, sending off many tortuous branches to the outer coat of the tube, ovary, and uterus. They communicate with the *spermaticae*, and with the arteries of the opposite-side.

Observation. Sometimes a distinct artery comes off from the *hypogastrica*, or especially from the *haemorrhoidea media*, which is distributed widely over the vagina: in this case the descending branch of the former artery is wanting, and the branches of this vaginal artery ascend to the cervix uteri, and communicate with the *uterina*.

VII) *Obturatoria*. This artery arises usually from the trunk of the *internal iliac*, or from the *iliaca posterior*, the *ischiadica*, or *ileo-lumbalis*; sometimes it arises from the *epigastrica*. It passes along the upper edge of the obturator internus, connected to the bones of the pelvis by cellular substance, and, accompanied by the vein and nerve, passes through the groove formed in the foramen ovale to the thigh. While it is in the pelvis, it sends off,

a) Branches to the iliac glands, to the psoas, iliacus internus, and levator ani: these are sometimes wanting.

b) Branches to the lower part of the bladder, the vesiculæ seminales, and prostate; also to the rectum. These are sometimes wanting; and sometimes they are large, and extend to the corpora cavernosa penis.

c) Coronary branch, passing along the inner side of the os pubis under the periosteum, and anastomosing with its fellow of the opposite side.

d) Branches to the obturator internus.

After the artery has passed out of the pelvis, it divides into

e) An exterior branch, which descends along the outer

side of the foramen, to the tuber ischii, and is distributed under the quadratus muscle: this gives off,

α) Branches to both the obturator muscles, and to the capsule of the joint:

β) Branch communicating with the *internal branch* of the *obturatoria*, on the adductor magnus:

γ) Branch to the back of the capsule, to the adductor magnus, and quadratus:

δ) Several anastomotic branches, communicating on the quadratus with the *circumflexa interna* of the *femoral*, and with the *ischiadica*, also with the *hæmorrhoidales externæ*, near the tuber ischii:

ε) Branches, which are sometimes wanting, and which pass over the quadratus to the upper part of the semitendinosus, biceps, and semimembranosus.

f) An *interior branch* which passes to the inner side of the foramen, under the obturator externus, and communicates with the *circumflexa interna*: it sends off,

1) Branches to the obturatores, to the capsule of the joint, the adductor longus, and the quadratus, communicating with the *circumflexa interna*;

2) Branch distributed to the integuments of the pubes;

3) Branch communicating with the *exterior branch* at the tuber ischii.

The rest of the trunk, which now meets with the *circumflexa*, is distributed to the quadratus and triceps.

VIII) *Iliaca posterior*, or *glutea*. This is the largest branch of the *hypogastrica*, and arises soon after the *sacræ laterales*, and *obturatoria*, from the back part of the trunk. At the upper margin of the pyriformis it bends downwards and backwards, so as to pass out of the pelvis between two of the origins of the ischiatic nerve. While it remains in the pelvis, it sometimes produces the *ileo-lumbalis*, *obtura-*

toria, sacræ laterales, ischiadica, and *pudenda communis.* Before it quits the pelvis, it sends off,

†) Branches to the rectum, which are sometimes wanting:

††) Branch to the iliacus internus, and os ileum:

†††) Branch to the pyriformis, gluteus medius, and minimus.

In its passage out of the pelvis, or a little after, the artery divides into

a) *Superficial branch,* which passes between the pyriformis and gluteus medius, under the gluteus maximus, and soon divides again into

α) An *ascending branch,* which runs between the gluteus maximus and medius, and is distributed to the upper part of those muscles. It communicates on the sacrum with the perforating branches of the *sacræ laterales,* and on the ileum with the branches of the *deep-seated branch.*

β) A *descending branch,* which is also distributed to the gluteus maximus and medius. It sends a branch through the sacro-ischiadic ligaments to the back of the sacrum.

b) *Deep-seated branch,* which is immediately covered by the gluteus medius; under which it divides into two branches:

α) *Superior branch,* which describes an arch on the dorsum of the ileum, along the origin of the gluteus minimus, and terminates on the front of the thigh:

†) Branches from the concavity of the arch to the gluteus medius and crista ilii:

††) Branches from the convexity of the arch to the gluteus minimus, and under it to the capsule of the hip:

†††) Nutritious branch to the bone.

β) *Transverse branch,* passing across the gluteus minimus towards the front of the thigh, and sending branches to the gluteus medius: it also sends off,

The *profundissima ilii,* which is situated close on the bone, and passes towards the front, supplying the bone, and

the gluteus minimus: it communicates with the *abdominalis*, and *circumflexa externa*.

IX) *Ischiadica;* this is smaller than the last, and follows the direction of the *hypogastrica*. It passes out of the pelvis between the lower margin of the pyriformis and the levator ani, and descends towards the thigh, under the gluteus maximus:

It sends off, within the pelvis,

a) Branches to the rectum, uterus, bladder, and obturator internus, which are sometimes wanting.

b) Branches to the pyramidalis, communicating with branches of the *pudenda*.

After quitting the pelvis, it sends off,

c) The *coccygea*, which goes towards the coccyx, and is distributed to the gluteus maximus, the coccygeus, the levator ani, and bones, and communicates with the *pudenda*:

d) *Comes nervi ischiadici*, which runs along the surface of the nerve, till it communicates with branches of the *circumflexa interna*, or *perforans prima profundae*:

e) Branches communicating with the *pudenda communis*, and *circumflexa interna*, over the tuber ischii:

f) Branch bending downwards and forwards, between the gemini and pyriformis, to the trochanter, and distributed to the surrounding muscles, the ischiadic nerve, the capsule of the joint, the trochanter, and acetabulum. One of them communicates with the *circumflexa interna*.

g) A *deep-seated branch*, descending to the tuber ischii, distributed to the muscles, which are affixed to it, and communicating with the *pudenda* and *obturatoria*.

h) Several *gluteal branches*, distributed to the gluteus maximus, and surrounding fat.

X) *Pudenda communis*, or *pudenda*, or *pudenda circumflexa, interna, media* and *externa*, often arises by a common trunk with the *ischiadica*, but may easily be distinguished from that artery, by being smaller, and situated farther from the sacrum. It passes out of the great sacro-ischiadic foramen, at the lower margin of the pyramidalis: there it is covered by the great sacro-ischiadic ligament, enters the pelvis at the lesser sacro-ischiadic foramen, passes along the internal surface of the tuber ischii, and ascends the ramus of that bone. Meeting with the transversus perinei, it divides into two branches. Its branches may be arranged in three divisions.

The first comprehends those arteries which arise while the trunk is still in the pelvis: these are,

α) Branches to the rectum, lower part of the bladder, vesiculæ seminales, and prostate; they are sometimes wanting.

β) Branch to the obturator internus.

The second division contains the branches sent off by the trunk, between the two sacro-ischiadic ligaments, and as it passes along the tuber ischii, which are,

1) Branches to the pyriformis and gluteus magnus:

2) Branch descending over the gemini and obturator internus, to communicate with the *circumflexa interna* and the *obturatoria*; this is frequently wanting:

3) Branch passing along the upper edge of the superior geminus to the trochanter, and sending branches to the acetabulum, gemini, obturator internus, and tro-

chanter. Sometimes its place is supplied by the branch *f*) of the *ischiadica*.

4) Branches distributed to the obturator, and origins of the semitendinosus and adductor magnus, and communicating with the *circumflexa interna* and *obturatoria*, round the tuber ischii.

5) Branches going off internally to the coccyx, and communicating with the *coccygea* and *ischiadica*.

6) *Haemorrhoideae externae*, which supply the levator and sphincter ani, and the fat of the perineum, and communicate on the rectum with the hæmorrhoideæ mediæ.

The third class includes the branches which are sent off from the trunk after it bends towards the ramus of the ischium. The artery, dividing near the transversus perinei, produces,

I) *Perinea superficialis*, which passes over the transversus perinei, and then, in *men*, ascends between the accelerator urinæ and the erector penis, and is distributed cutaneously: in *women*, it passes between the erector clitoridis and the sphincter vaginæ. It sends off,

a) *Transversa perinei*, which passes across to the transversus perinei, sphincter ani, and skin: in women, to the sphincter vaginæ, and labia:

b) Branches to the accelerator urinæ, and to the erector penis, or clitoridis:

c) Branches to the cellular substance of the scrotum in men, to the labia in women:

d) Branches to the corpora cavernosa penis, or clitoridis:

e) The last branches, which extend to the penis in men, to the labia in women, communicate with the *pudendæ externæ*.

II) *Profunda penis---clitoridea*: in the *male subject* the artery passes along the ramus of the ischium, and of the pubis, till it arrives at the symphysis of the pubes,

when it divides again. In the *female*, the artery passes between the sphincter vaginæ and the erector clitoridis, to the body of the clitoris. In *males*, it sends off,

a) Two large branches to the urethra, extending to the penis;
b) Smaller branches to the accelerator urinæ and erector penis, to the crura penis and prostate.

At the above-mentioned part the artery divides into,

c) *Superficialis dorsi penis*, which runs along the back of the penis, as far as the glans, and gives off,
1) Branches to the ſcrotum, communicating with the other scrotal arteries:
2) Branches to the surface of the corpora cavernosa, and præputium:
3) Branches communicating with similar branches of the opposite artery, near the glans:
4) Branches to the frænum præputii:
5) Branches entering the glans.

d) *Deep-seated branch*, which having communicated with the opposite artery, enters the corpus cavernosum of its own side, and passes along to the end of it. The branches of this artery open into the cells of the corpora cavernosa; some of them descend to the corpus cavernosum of the urethra, and others, perforating the septum penis, open in the cells of the opposite side. From these openings the blood is poured into the cells of the penis in erection.

The *clitoridea* produces, in women,

a) Branches to the transversus perinei, and erector clitoridis, to the clitoris and vagina.

The trunk divides into,

b) *Ramus vaginalis major;*
c) *Superficialis dorsi clitoridis;*
d) *Deep-seated branch*, which penetrates the corpora cavernosa, as in men.

II. Iliaca externa, continues in the direction of the iliac trunk, and passes along the inner edge of the psoas muscle: afterwards it is supported by the tendon of the psoas and iliacus internus; and, lastly, it arrives at the thigh, under Poupart's ligament, holding a middle situation between the crural nerve and the iliac vein. After it has passed this ligament, the trunk takes the name of *femoralis communis*. Its branches are,

I) Insignificant twigs to the psoas and iliac muscles; the lymphatic glands, the peritonæum, and surrounding fat: they are sometimes wanting.

II) *Epigastrica*. This artery arises at an acute angle from the inner side of the trunk, near the lower insertion of Poupart's ligament: from that part it descends; but is soon reflected behind the internal and posterior surface of the spermatic chord. Then, being situated on the peritonæum, it crosses the upper and outer commissure of the abdominal ring, bends under the lower part of the transversalis muscle, towards the rectus, behind which it ascends to the navel. Lastly, it terminates in two principal branches.—Throughout the whole of its course it sends off the following arteries:

1) A branch, which arises under the chord, passes through the abdominal ring, and is distributed to the spermatic chord. It sends branches to the fat of the pudenda,

to the cremaster, tunica vaginalis, and epididymis; and communicates with the *spermatica aortae.*

Observation. In females, this artery sends a branch along the ligamentum teres to the uterus, and other branches to the mons veneris and labia pudendi.

2) Insignificant branches to the lower part of the transversalis and rectus:

3) Larger branches given off from each side of the trunk, to the surrounding muscles, through which they penetrate to the skin:

4) *Outer branch* is the smaller of the two arteries, into which the trunk divides, just below the navel: it passes outwards towards the ribs, and gets between the obliquus internus and transversalis; it communicates with the *outer branch* of the *mammaria interna* and with the *intercostal arteries:*

5) *Inner branch,* which goes obliquely towards the navel, and divides into,

†) A *superficial branch,* which passes out between the recti, to be distributed to the skin, where it communicates with the artery of the opposite side, as well as with the *mammaria:*

††) A more *deep-seated branch,* which being distributed to the under surface of the rectus, communicates above the navel with the *inner branch* of the *mammaria.* Two of its branches perforate the navel, and descend into the cavity of the abdomen with the umbilical arteries and vein.

III) *Abdominalis,* or *circumflexa ileum,* or *iliaca externa minor,* is smaller than the epigastrica, and is given from the outer side of the trunk; it takes a retrograde course upwards and outwards, under the peritonæum, till it arrives at the crista of the ileum, along which it passes at the outer attachments of the ili-

acus internus, and terminates on the abdominal muscles. It sends off,

a) A branch, which is distributed to the iliacus internus, sartorius, inguinal fat, and glands;

b) Branch to the spermatic chord, which is often wanting;

c) Several branches to the psoas and iliacus internus, and crural nerve, communicating with the *transverse branch* of the *ileo-lumbalis*;

d) Four or more branches ascending to the abdominal muscles, and communicating towards the front of the abdomen with the *intercostales*, *lumbales*, and *mammaria*;

e) Branch anastomosing with the ileo-lumbalis, about the middle of the crista of the ileum;

f) Branch, which is the termination of the artery, distributed between the obliquus and transversalis.

FEMORALIS COMMUNIS. This is the name which the artery assumes, when continued under Poupart's ligament to the thigh. It is surrounded by a quantity of cellular substance and fat, some of the inguinal glands, and the fascia lata of the thigh. After a course of about two inches, it divides, over the lower attachment of the iliacus internus, into two arteries of nearly equal magnitude; one, which is the continuation of the trunk, is called *femoralis superficialis*; the other, which is given off from the back part of the trunk, takes the name of *femoralis profunda*. The following branches are given off from the common trunk:

I) Insignificant branches to the skin of the abdomen:

II) *Inguinal branches*, which are principally distributed to the inguinal glands:

III) A small branch passing outwards towards the attachment of the sartorius, and distributed to the iliacus internus, crista ilei, fascia lata, and gluteus medius:

IV) Small branches to the iliacus, psoas and pectineus, communicating with the *circumflexa interna*:

V) *Pudenda externa superior*:

VI) *Pudenda externa media*:

VII) *Pudenda externa inferior*. These three arteries are distributed to the upper, middle, and lower part of the skin and fat of the pudenda, both in the male and female sex. The inferior artery communicates with similar superficial branches of the *obturatoria* and *circumflexa interna*, and with the *perinea superficialis*:

VIII) Branch to the sartorius, and rectus anterior, which often descends far amongst the muscles, with the branches of the crural nerve.

Observation. All these arteries are subject to great variety, both with respect to their origin, number, and distribution.

I. Femoralis profunda, is covered at its origin by the *fem. superficialis*, as well as by a

large quantity of fat and glands: it is situated on the junction of the psoas and iliacus muscles, in the deep triangular hollow formed between the iliacus, the pectineus, and the adductors; through which hollow it descends to the upper attachment of the vastus internus. There it makes a gentle turn forwards, to get between the adductor brevis & longus and the vastus internus, in which situation it passes as far as the middle of the thigh-bone. Here it penetrates between the adductor brevis & longus to the adductor magnus, through which it sends various branches to the posterior muscles of the thigh. The course and magnitude of this artery varies in proportion as it is given off from the *fem. communis* sooner or later, or as it sends off greater or smaller branches. Some of these are of less consequence; but there are four which particularly deserve to be noticed.

I) Branches, of little importance, to the iliacus internus, capsule of the hip, sartorius, vasti, and the adductors.

II) *Circumflexa externa*, is sometimes a branch of the *fem. superficialis;* but usually it is the first branch of the *profunda.* It passes under the rectus anterior and the sartorius, the tensor fasciæ latæ and front of the gluteus medius, to the tendinous origin of the sartorius; and, lastly, it disappears near the

root of the trochanter major. In this course it sends off,

1) A branch which enters the substance of the iliacus internus, along which it returns into the cavity of the pelvis:

2) Branch passing under the iliacus to the inside of the thigh, and communicating with the *circumflexa interna* near the trochanter:

3) *Great transverse branch* is the upper part of the trunk, about to be covered by the vastus: it sends off,

α) Branches to the iliacus, tensor fasciæ, upper parts of the sartorius and rectus, and the front of the gluteus medius;

β) Branch passing outwards between the iliacus and gluteus minimus, and communicating with the *profundissima ilei*;

γ) *Trochanterica anterior*, is a small branch ramifying on the front of the great trochanter, giving branches to the surrounding muscles and capsule of the joint, and communicating with the *trochanterica posterior.*

δ) Two or three large branches, in which the trunk terminates, passing under the vastus externus to the back of the thigh, where they communicate with the *circumflexa interna* and *perforans prima.*

4) *Great descending branch*, given off from the trunk, as it is continued into the above-mentioned *transverse branch*, and descending along the inner edge of the vastus internus to the knees, where it is often seen to communicate with the *articularis externa.* Its branches are,

α) Large branch to the back surface of the rectus, where it often communicates with the *r:us anastomoticus magnus* of the *fem. superficialis*:

β) Branches, from three to six in number, distributed to the substance of the vastus, and passing backwards on it, to communicate with the *perforating arteries.*

Observation. Besides the communication which the trunk itself makes with the *articularis sup. ext.* it sends a branch between the rectus and cruralis to anastomose with the *articularis sup. int.* and *r:us anastomoticus.*

5) *Smaller descending branch*, which sometimes arises from the *fem. superf.* but usually from the *great transverse branch* of the *circumflexa ext.* bends inwards towards the vastus internus, along which it descends, and communicates, under the tendon of the triceps, with the *perforans inferior fem. superf.*

III) *Circumflexa interna* arises from the inner and back part of the trunk, about the middle of the pectineus; there it passes above the trochanter minor, and arrives between the adductor brevis & magnus; it then goes outwards and backwards near the bone, to the interspace between the quadratus and adductor magnus, where, dividing into two branches, it is partly distributed to the muscles inserted into the thigh-bone, and partly ascends to the flexors of the leg. In this course are produced the following branches:

1) Branches to the psoas and iliacus internus to the pectineus, capsule of the joint, adductor brevis & longus, and the gracilis: they communicate with the *fem. superf.* and *circumflexa ext.*: these arise before the trunk is covered by the pectineus.

2) Branches given off between the trochanter minor and acetabulum, to the origins of the adductors, the pectineus, and capsule.

3) *Anterior branch*, passing transversely towards the symphysis pubis, giving its branches to the adductor and gracilis, and terminating in the skin of the pudenda, by communicating with the *pudendae externae.*

4) *Posterior circumflex branch*, which is the continuation of the trunk towards the neck of the thigh-bone: it sends branches to the joint, to the obturator externus, adductor magnus, between which and the quadratus it divides into,

a) An *upper* and *outer branch*, which is also called *trochanterica posterior*. This artery passes upwards and outwards to the back part of the bone, and distributes its branches to the joint and surrounding muscles, as the adductor magnus, obturator externus, and quadratus. Its ascending branches communicate with the *ischiadica obturatoria*, *trochanterica ant.* and *iliaca posterior*. Its descending branch communicates, near the root of the trochanter, with the *perforans prima*.

b) A *lower* and *inner branch*, which is generally larger than the former, and passes outwards to the common origin of the flexors of the leg from the tuber ischii, where it communicates with the *ischiadica*, *obturatores*, and *pudenda*.

IV) *Perforans prima* arises below the trochanter minor, and passes between the pectineus and adductor brevis, or through the fibres of the latter muscle, near the vastus internus: it afterwards penetrates the adductor magnus in two places, and is finally distributed to the gluteus magnus and the flexor muscles: it sends off,

1) Branches to the adductor brevis & magnus;

2) Branches to the adductor magnus, trochanter, and quadratus, after the trunk begins to be hidden;

3) An ascending branch, communicating with a descending branch of the *trochanterica posterior*;

4) *Great transverse branch*, passing under the adductor towards the gluteus, and then over its tendon to the vastus externus, where it communicates with the *great transverse branch* of the *circumflexa externa*;

5) Branch passing through the adductor to the gluteus magnus, and communicating with the *gluteal branches* of the *ischiadica*;

6) An artery for the supply of the bone, communicating with a similar branch of the *perforans secunda*;

7) *Great perforating branch;* this penetrates the adductor magnus, and runs down the back of the thigh, distributing its branches to the adductor magnus, and to all the flexors, and communicating above with the *circumflexa interna*, below with the *perforans secunda*.

V) *Perforans secunda* is the continuation of the trunk, which penetrating between the abductor brevis & longus, passes obliquely downwards and outwards between the thigh and the adductor magnus, which muscle it penetrates about the middle of the thigh, to be distributed to the flexors. It sends off the following branches:

1) Large branches to the vastus internus and adductor longus: one of these sends a branch to the substance of the bone, which communicates with the *nutritia magna*:

2) Large branch perforating the adductor longus, and distributed to the substance of the adductor magnus:

3) Ascending branch, communicating with the *perforans prima*:

4) *External superior branch*, passing a little below the tendon of the gluteus magnus to the vastus externus, and communicating with the *circumflexa externa*. Sometimes a branch of this artery passes on to the flexor muscles, and is distinguished by the name of *perforans tertia*.

5) *External inferior branch*, holds a similar course with the former, but is situated lower down; when it extends to the flexor muscles, it takes the name of *perforans quarta*. It sends off,

a) Several branches to the adductor magnus;

b) *Nutritia magna femoris*, which descends along the outer side of the linea aspera, communicates with the *nutritia*

inferior of the *perforans inf. fem. superf.*, and then enters the substance of the bone :

c) Branch to the biceps :

d) Branches communicating with the *descending branch* of the *circumflexa ext.* and with the *articularis sup. ext.* on the vastus externus :

7) Several branches to the short head of the biceps :

8) *Descending perforating branch*, is the continuation of the trunk, which perforates the adductor magnus, to be distributed to the flexor muscles. It communicates above with the *perforans prima*, below with the *perforans superior* of the *fem. superf.*

II. Femoralis superficialis. This artery, which lies rather superficially, is every-where covered by the fascia lata ; above it is also protected by the inguinal glands, and in the middle by the sartorius, which crosses obliquely over the thigh. It passes downwards, inwards, and backwards, getting gradually from the front of the thigh to the inside, and from thence to the cavity of the ham. At its upper part it is separated from the *femoralis profunda* by a quantity of fat and glands ; there it is situated on the vastus internus, and afterwards between that muscle and the adductors, where it meets with, and passes through an oblique canal, formed in the common tendon of the adductors. Thus it arrives in the ham, and takes the name of *Poplitea.* The artery passes along two-thirds of the

thigh before it turns to the back part, and the vessel is more deeply seated there than in the upper part. The branches of this artery are,

I) Numerous branches throughout its whole course to the inguinal glands, sartorius, rectus, vastus internus, adductor longus & brevis, and gracilis.

II) *R:us anastomoticus magnus*, arises at the upper part of the tendinous canal, from the inner side of the trunk. It bends immediately upwards, and plunges into the substance of the vastus internus. It sends off,

1) A branch to the sartorius:

2 A branch, which accompanies the outer side of the tendon of the sartorius, over the knee-joint, and is distributed to the skin and fascia of the leg: it sends branches to the joint, which communicate with the *articulares inferiores*, and *recurrens tibialis anticae.*

3) Branch accompanying the tendon of the triceps, to the internal condyle of the femur, where it communicates with the *artic. ext. sup. & inf.* and supplies the joint.

4) Branch passing transversely through the vastus, from which it emerges, and is distributed to the rectus, where it communicates with the *greater descending branch* of the *circumflexa ext.*

5) Branch emerging from the vastus at the knee, and communicating with the *articular arteries.*

6) Branch ascending on the vastus or cruralis, and communicating with the *lesser descending branch* of the *circumflexa externa.*

III) *Perforans superior*, is given off by the trunk while it is passing through the tendon of

the triceps, and penetrates the adductor magnus, to be distributed to the lower part of the flexor muscles: it sends off,

†) Branches to the neighbouring muscles:

††) *Perforating branch*, which communicates above with the *perforans secunda*, below with the *perforans inferior*.

Observation. The perforating branch of this, as well as the next artery, is sometimes wanting, and then the trunk passes under the biceps to the vastus externus, and communicates with the *articular* arteries.

IV) *Perforans inferior*, arising a little below the former; it passes transversely under the adductor magnus, to be distributed to the muscles at the back of the thigh. It sends off,

a) Small branches to the neighbouring muscles:

b) *Nutritia magna inferior*, which passing upwards to the linea aspera, and communicating with the *nutritia superior*, is ultimately distributed to the bone:

c) *Perforating branch*, distributed to the semimembranosus, and communicating with the *perforans inferior*. It is frequently wanting.

d) Branches which communicate on the vastus externus with the descending branches of the *circumflexa externa*.

The term POPLITÆA is applied to the trunk, while it is passing through the ham. As it is necessary accurately to define this part of the artery, on account of the branches which it produces; we may say that it begins at the posterior

edge of the tendon of the triceps, and terminates at the upper extremity of the soleus, where it divides into the *tibialis antica & postica.* It descends between the flexor tendons, surrounded by a large quantity of fat, and is received into the cavity, formed between the condyles of the femur and the heads of the gastrocnemeus. Passing over the knee-joint, it is covered by the aponeurosis of that joint, and lies immediately on the capsule; afterwards it is situated on the popliteus muscle. The branches, which it sends off on each side, may be divided into *articulares & musculares*: the former are,

I) *Articularis superior externa:* this is given off from the outer side of the trunk, above the condyle; it passes under the tendon of the biceps, to the vastus externus, where it divides into two branches.

1) Small branches to the capsule, biceps, and gastrocnemei:

2) *Deep-seated branch*, which penetrates through the vastus, to the inner condyle, where it communicates with the *artic. inf. ext.* and the *perforantes* of the *fem. superf.*: it also sends branches towards the inner condyle, to communicate with the *art. sup. int.*

3) *Superficial branch*, which bends towards the upper margin of the patella, communicates with the *greater descending branch* of the *circumflexa ext.* and with the *anastom. mag.* under the rectus, and contributes with the other articular arteries to the vascular rete which surrounds the knee.

II) *Articularis superior interna*, is given off from

the inner side of the trunk, and passes transversely above the internal condyle to the patella. Its branches supply the ligaments and capsule of the joint, and communicate with the other articular arteries.

III) *Articularis media*, or *azyga*, arises either from the outer and back part of the *poplitea*, or from one of the above-mentioned *articulares*: it divides into an external and an internal branch, which are distributed to the back of the capsule, to the crucial ligaments and semilunar cartilages.

IV) *Articularis inferior externa.* This artery comes off below the knee, passes under the plantaris, and outer head of the gastrocnemeus, to the top of the fibula; then it goes along the outer semilunar cartilage, under the external lateral ligament, and aponeurosis of the joint, to the patella.

1) Branches to the popliteus, soleus, gastrocnemeus, and periosteum:

2) Branch, which forms a remarkable anastomosis with the *recurrens tibialis anticae*:

3) Superficial branch, communicating with the other articular arteries, especially with the *art. sup. ext.*

4) Small branches to the semilunar cartilages, periosteum, and capsule.

5) Deep-seated branch, which penetrates the capsule near the patella, and is distributed to the ligaments of the joint.

V) *Articularis inferior interna*, descends to the posterior angle of the inner condyle of the femur, and pursues its course under the in-

ternal lateral ligament and flexor tendons to the lower part of the patella.

a) Branches to the back part of the joint;

b) Superficial branches communicating about the patella with the *tibialis antica*:

c) Branches communicating with the *art. sup.* and *inf. ext.* at the ligamentum patellæ;

d) Deep-seated branch, entering the cavity of the joint.

Observation. The vascular net-work which covers the knee, is formed by all the *articulares*, by the *recurrens tibialis*, the *circumflexa externa*, the *ramus anastomoticus magnus*, and some branches of the *perforantes*.

VI) *Muscular arteries*, which are numerous, and very variable: the following may be remarked:

1) Two or three branches, which are often wanting, to the flexor muscles. They sometimes supply the place of the *perforantes fem. superf.* by reflected branches.

2) Two branches, which pursue a parallel course between the heads of the gastrocnemeus, to supply the inner side of that muscle. One of those descends along the tendo Achillis, as far as the os calcis.

3) Two branches to the soleus, which are sometimes wanting:

4) Branches to the plantaris longus, the periosteum, and nerves.

I. Tibialis antica, is rather smaller than the *tibialis postica*. It is sent off from the front of the artery, at the lower border of the popliteus muscle, immediately passes through the interosseous ligament, and appears on the

front of the leg. It descends on the interosseous ligament, between the tibialis anticus and the extensor communis at first, and afterwards between the tibialis and the extensor pollicis longus. As it proceeds towards the foot, it advances forwards and inwards, gradually separating from the interosseous ligament. It passes over the ancle-joint, and tarsus, in company with the extensor tendons, and divides into two branches between the bases of the first and second metatarsal bones; one of these branches descends between the bones into the sole of the foot, and communicates with the branches of the tibialis postica; the other runs along the back of the foot to the great toe. The artery sends off the following branches in its course:

I) Branch to the origin of the tibialis posticus, or soleus;

II) Branch ascending under the popliteus, and distributed, on one side, to the outer and back part of the tibia and capsule of the knee; on the other side, to the head of the fibula, the soleus, and joint. It communicates with the *articulares inf.*

Observation. These branches are given off before the interosseous ligament.

III) *Recurrens tibialis* arises just after the artery comes out in the front of the leg, and immediately ascends to the front of the knee.

a) Branches to the neighbouring muscles and ligaments:

b) Branch which turns round the head of the fibula, under the extensor digitorum communis & peroneus longus, and communicates with the branch No. II.

c) Branches communicating with the *articulares inf.*

IV) A large branch descending between the tibialis anticus and peroneus longus, to the lower extremity of the fibula, where it communicates with the *peronea.*

V) Small branches to the tibialis anticus, the extensors, the peronei, and the periosteum of the tibia:

VI) Small branches to the extensor tendons, and surface of the bone, where they communicate with the *tibialis postica* and *peronea antica;*

VII) *Malleolaris interna* ramifies on the inner ancle, and is distributed to the capsule of the joint, the os calcis, os naviculare & cuneiforme, where it has various communications with the branches of the *plantaris interna*:

VIII) *Malleolaris externa*, having made a remarkable communication with the *peronea antica*, or with some other branch of the *peronea*, proceeds to the outer ancle, where it supplies the joint, the extensor communis brevis, the peroneus brevis, and tendons of the peronei, under which it anastomoses with the *peronea posterior*. Lastly, it joins the *tarseal arch*.

IX) Branches to the lower part of the tibia, to the capsule of the ancle, the extensor tendons,

and the bones of the tarsus. The upper branches communicate with the *peronea*, the others with the *plantaris interna*.

X) *Tarsea* is given off from the outer side of the trunk; it descends under the extensor brevis, along the second phalanx of tarsal bones, till it terminates by a communication with the *plantaris externa*. Thus it forms the *tarsal arch*. It sends off,

a) A branch to the ancle-joint, communicating with the *peronea postica* and the *malleolaris externa*:

b) Branches to the extensor brevis:

c) Branches distributed to the ossa cuneiformia and os cuboides:

d) *Interossea dorsalis prima*:

e) *Interossea dorsalis secunda*:

f) *Interossea dorsalis tertia*. These arteries pass along the intervals of the metatarsal bones, and, arriving at the roots of the toes, are implanted into the bifurcations of the *digitales plantares*.

g) Branch arising from the union of the *tarsea* and *plantaris externa*, running along the fifth metatarsal bone, and terminating on the abductor minimi digiti.

Observation. The *interosseæ dorsales* sometimes arise from the *metatarsea*, and then the branches of the *tarsea* are very small, and communicate with them. Sometimes these *interosseæ*, assisted by the *perforating branches* of the *tibialis postica*, produce one or two of the *digitales plantares*. Sometimes they produce arteries for the back of the toes.

XI) Branches from the inner margin of the artery, to the inside of the tibia, the neighbouring tendons, the os naviculare and cuneiforme primum; one of these is covered

by the abductor pollicis, and communicates with the *plantaris interna.*

XII) Branch to the abductor pollicis, following the inner side of the back of the great toe.

XIII) *Metatarsea* varies in size, being sometimes altogether wanting, according to the number and magnitude of the branches of the *tarsea.* It passes transversely along the heads of the metatarsal bones, and produces the *interosseæ,* unless they are previously produced by the *tarsea.* It terminates on the abductor minimi digiti and skin of the sole of the foot.

XIV) *Dorsalis externa hallucis* is the superficial branch of the divided trunk. It passes along the outer side of the first metatarsal bone, on the interosseous muscle.

a) Small branches to the metatarsal bones, and extensor tendons:

b) *Dorsalis indicis interna,* which goes along the inner side of the back of the toe:

c) *Dorsalis hallucis externa,* which anastomoses with the *plantaris pollicaris interna,* and then goes along the outer side of the back of the toe, to the end of the toe.

XV) *Deep-seated anastomosing branch,* which enters the sole of the foot at the above-mentioned part, and joins the *plantaris externa* of the *tibialis postica,* to complete the plantar arch; previous, however, it sends off small branches to the adductor and abductor pollicis. From the place of union, or even

before, arises the *pollicaris plantaris*, which will be described hereafter.

II. TIBIALIS POSTICA descends on the posterior surface of the flexor longus digitorum and tibialis posticus, and under the soleus, to the lower extremity of the tibia; then it pursues a tortuous course behind the internal malleolus to the sole of the foot. Here it is covered by the ligamentum laciniatum, and a quantity of fat; it meets with the broad extremity of the abductor pollicis, near which it divides into two branches; one of these, which is called the *plantaris interna*, proceeds to the great toe; the other, which is the *plantaris externa*, runs between the flexor longus & brevis to the fifth metatarsal bone, then makes an oblique turn, and proceeds transversely along the heads of the metatarsal bones towards the great toe, so as to form the *plantar arch*. It sends off the following branches:

I) Branches to the inner head of the gastrocnemeus, which are often wanting:

II) *Nutritia magna tibiæ*, or *interossea posterior*, descends on the interosseous ligament, and communicates towards the bottom of the tibia, with the *peronea*. It sends off,

a) Branch to the soleus, popliteus, and periosteum of the tibia, communicating with the *articularis inf. int.*

b) Branch to the tibialis posticus:

c) Branch which enters the bone itself:

d) Various branches to the periosteum of the tibia, the tibialis, and flexor communis.

III) Branch which passes round the head of the fibula, under the muscles, and communicates with the *recurrens tibialis anticæ*:

IV) Several branches to the soleus, communicating with the *peronea*:

V) Cutaneous branches, which accompany the veins and nerves, and communicate with the *tibialis antica*:

VI) *Peronea communis.* This artery varies very much in its size, and in the manner of distributing its branches: for it is sometimes as large as the *tibialis antica*; at other times entirely wanting. Arising near the upper extremity of the tibialis posticus, it descends between that and the flexor pollicis longus, which muscle rather covers it. Afterwards it lies on the interosseous ligament, and towards the lower part of the leg it divides into the *peronea anterior & posterior.*

α) Branches to the soleus, and through that to the skin: they communicate with the *tibialis postica*:

β) Branches to the tibialis, flexor pollicis, and periosteum of the fibula:

γ) Branches passing towards the front of the fibula, where they communicate with the *tibialis antica*:

δ) Several branches given off throughout the whole course of the trunk to the tibialis posticus, peronei, flexor pollicis, tendon of the gastrocnemeus and soleus,

Some of these, perforating the interosseous ligament, are distributed to the anterior muscles:

ε) *Nutritia fibulæ* sends a few twigs to the periosteum, and then enters the substance of the bone;

ζ) *Peronea posterior* is the larger and more constant branch of the *peronea communis*; it descends to the outer surface of the os calcis, and communicates with some branch of the *plantaris externa;* or else it terminates on the abductor minimi digiti and skin. It sends off,

1) Branches to the flexor digitorum longus and peronei;

2) *Transverse branch*, which passes close upon the tibia in a transverse direction, and communicates with the *tibialis postica*. Sometimes it sends off branches to the ancle-joint, which communicate with the *malleolaris externa*;

3) Branch ramifying to the outer part of the os calcis, where it communicates with the branches of the *tibialis antica*;

4) Branches passing forwards and outwards to the os calcis, and communicating with the *tibialis postica*;

5) Branches to the tendons of the peronei and their sheaths, communicating with the *peronea anterior;*

6) Branches to the abductor digiti minimi, communicating with the *plantaris externa*.

η) *Peronea anterior* passes between the two bones of the leg, at the angle formed by the end of the fibula and the tibia; it comes out behind the extensor pollicis and peroneus brevis, where it communicates with the *malleolaris externa*, and then descends over the external malleolus. Lastly, it accompanies the tendon of the peroneus to the os cuboides, and communicates with the *plantaris externa*.

a) Branches to the periosteum of the tibia and fibula, and tendons of the peronei;

b) Branch communicating with the *tibialis antica* behind the extensor tendons;

c) Branch to the capsule of the joint, communicating with the *tarsea*;

d) Branches anastomosing at the outer side of the os calcis with the *peronea posterior*:

e) Branch which unites with the *tarsea* at the os cuboides, and thereby contributes to the tarseal arch:

f) Branches to the abductor digiti minimi.

VII) Numerous branches throughout the whole course of the artery, to the neighbouring muscles:

VIII) *Transverse branch*, which communicates, as was before mentioned, with the *peronea postica*:

IX) Branch to the inner malleolus, communicating with the *malleolaris interna*:

X) Branches to the flexor tendons and their sheaths:

XI) Two large branches to the bottom of the os calcis, communicating with the *peronea*:

XII) Two other branches to the neighbouring bones and joints:

XIII) *Plantaris externa*. This is the largest of the two branches of the *tibialis postica*; it passes between the flexor brevis digitorum and flexor accessorius, to the inner side of the abductor minimi digiti, along which it goes to the basis of the metatarsal bone of the little toe. Then it bends inwards towards the great toe, so as to form the plantar arch, which inosculates with the trunk of the *tibialis antica*, at the first interval of the metatarsal bones.

1) *Transverse communicating branch*, passing along the front and lower part of the os calcis, and communi-

cating on the inner side of that bone with branches of the *tibialis antica*, on the outer side with the *peronea postica*:

2) Branches to the great ligament of the os calcis:

3) Several branches to the surrounding muscles, extending to the plantar fascia and skin:

4) *Profunda prima*, which passes towards the outside of the os calcis, and communicates with the *peronea posterior*; it also unites with the *deep-seated branch* of the *plantaris interna* on the surface of the os calcis:

5) *Profunda altera* holds a similar course to that of the former artery, and has the same communications; it also contributes to the net-work formed in the hollow of the foot:

6) Branches to the abductor digiti minimi, and periostea of the neighbouring bones, forming various communications on the bones with the other small arteries:

7) An artery to the outside of the little toe; this is given off just as the trunk is beginning to form the arch, and it passes along the outside of the toe, as far as its apex.

8) *Plantaris digitalis secunda*;

9) *Plantaris digitalis tertia*;

10) *Plantaris digitalis quarta*: these three arteries arise at the intervals between the metatarsal bones, proceed to the roots of the toes, and then, covered by the transversalis pedis, divides into two branches, which are distributed to the toes, as the branches of the ulnar artery are to the fingers. At the point of bifurcation they receive the *interosseæ dorsales*. The *tertia* and *quarta* communicate with the outer branch of the *plantaris interna*.

The plantar arch sends off, between these digitales, two *interosseæ profundæ*, and four *perforantes posteriores*:

11) *Interossea profunda;*

12) *Interossea profunda altera:* these two arteries run along the second and third metatarsal intervals, send branches to the surrounding muscles, and communicate with the *interosseæ dorsales* and *digitales plantares:*

13) *Perforans posterior intervalli quarti;*

14) *Perforans posterior intervalli tertii;*

15) *Perforans posterior intervalli secundi;*

16) *Perforans posterior intervalli primi:* these pass between the metatarsal bones to the back of the foot, and anastomose with the *metatarsea.*

17) Three branches sent off from the concave side of the arch, and communicating with the deep-seated branches of the *plantaris externa* and *interna,* in the hollow of the tarsus.

The *plantaris externa,* uniting with the *tibialis antica* between the first and second metatarsal bones, causes an increase in the size of the trunk, which at the outer side of the metatarsal bone of the great toe, and under the adductor pollicis, produces,

18) *Pollicaris plantaris,* or *interna,* which is sometimes produced by the *tibialis antica;* in which case that artery still sends on a communicating branch to meet the *plantaris externa:* it gives off,

a) A branch which sends an artery to the inside of the second toe, and to the outside of the great toe. It anastomoses with the *outer branch* of the *plantaris interna.*

b) An artery to the inner side of the great toe, running along that side as far as the apex of the toe. It anastomoses with the *middle* and *inner branch* of the *plantaris interna.*

c) *Dorsalis interna hallucis;* passing along the inner side and back of the great toe, as far as the nail, and communicating with the *dorsalis externa.*

Observation. All the *digitales* send numerous branches to the skin, bones and ligaments; and they also send arteries to the back of the fingers, unless they are supplied by the union of the *interosseæ* and *perforantes.*

XIV) *Plantaris interna,* arising in the hollow internal part of the os calcis, between the tendon of the tibialis posticus, and the origin of the abductor pollicis, is rather covered by the latter muscle, under which it divides into four branches, which follow the course of the abductor and flexor brevis to the lower extremity of the metatarsal bone of the great toe, and terminate in the branches of the *pollicaris plantaris.* Its branches are the following:

1) A branch to the flexor tendons and os calcis, communicating with the *malleolaris interna,* and other branches of the *tibialis antica.*

2) Branches to the abductor pollicis and flexor brevis digitorum.

3) A deep-seated branch distributed to the flexor brevis and accessorius, and communicating on the os calcis with the *profunda plantaris externæ.*

4) *R:us internus plantaris internæ* is the first of the four branches into which the *plantaris interna* divides: it arises at the os naviculare, and follows the inner edge of the abductor pollicis, till it inosculates with the artery of the inside of the great toe: it sends off,

a) Several cutaneous branches;

b) Branches to the dorsum pedis, where they communicate with the *tibialis antica*;

c) Branches to the bones of the tarſus.

5) *R:us medius profundus plantaris internæ* lies under the abductor pollicis, and passes over the os cuneiforme and first metatarsal bones to inosculate with the artery

of the inside of the great toe. Its branches are like those of the former.

6) *R:us exterior plantaris internæ profundus*, passes between the flexor brevis and abductor pollicis towards the second toe, and terminates by a communication with the branch which that toe receives from the *pollicaris plantaris*: it sends off,

α) Branches to the flexor and abductor pollicis, and flexor communis digitorum:

β) Several cutaneous branches:

γ) Small branch communicating with the *plantaris digitalis tertia*, and thereby forming a sort of superficial arch.

Observation. The *pollicaris plantaris* is considerably augmented by its inosculations with these three arteries.

7) *R:us externus plantaris externæ* passes outwards as far as the os cuboides, sending branches to the adjacent muscles, the ligaments and bones of the tarsus, which communicate with the deep-seated plantar branches, with the retrograde branches of the plantar arch, and with the *plantaris interna*. But it must be remembered, that the branches of the *plantaris interna*, as well as the other arteries of the foot, are subject to great variety.

THE END.

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